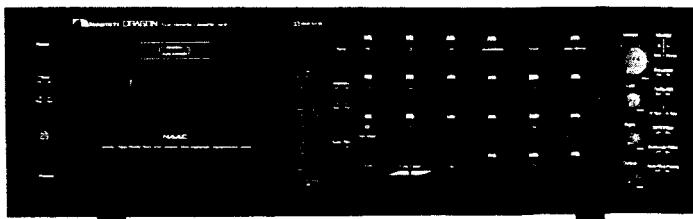




Service Manual

Nakamichi DRAGON

Auto Reverse Cassette Deck



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1. GENERAL

1.1. Voltage Selector

Voltage selector is installed on the rear panel for Other version of the Nakamichi DRAGON.
This voltage selector can select either 120 V or 220-240 V at customer's disposal.

1.2. Parts List for Carton and Packing

Part No.	Description	Q'ty
OF03685B	Inner Carton	1
OF03686B	Outer Carton	1
OF03629B	Packing	2

2. MECHANICAL ADJUSTMENTS

2.1. Mechanism Control Cam Adjustment

Before adjustment, remove the Front Panel Ass'y and the Cover Plate.

(1) Offset Adjustment of Control Motor Driver

(a) Refer to Fig. 2.1.

Adjust VR604 and VR603 on the Logic P.C.B. Ass'y to locate approximately at the middle of the variable range. Then turn ON the Power switch.

VR604 (for Cam position stop)
VR603 (for Cam position play)

(b) Press the Stop button to set the cassette deck in Stop mode. Adjust VR604 (for stop) so that the "S" mark on the Cam corresponds to the pointer on the mechanism chassis.

(c) Press the Play button to set the cassette deck in Playback mode. (Cam will rotate, and the position marked with "PY" comes to the pointer.) Adjust VR603 (for play) so that the "PY" mark on the Cam corresponds to the pointer.

(d) Repeat above (b) and (c) 2 - 3 times so that the "S" and "PY" marks on the Cam correspond to the pointer accurately in Stop and Playback modes respectively.

(This adjustment is required because the position adjusted by one volume will be slightly changed when the other volume is adjusted.)

(e) Set the cassette deck in F.F., Pause, or Cue mode by pressing each button.

Check to insure that the pointer is in a range of "F", "PS", "CU" mark respectively.

(f) If out of the range, precise adjustment for each position according to "(2) Offset Fine Adjustment of Control Motor Driver" will be required.

(2) Offset Fine Adjustment of Control Motor Driver

Adjust only if a satisfactory result is not obtained in "(1) Offset Adjustment of Control Motor Driver". This adjustment is made by changing the value of the fixed resistors on the Logic P.C.B. Ass'y. Note: The value of voltage is typical value.

(a) Observation Point of Reference Voltage

Observe the each voltage at the sliding contact of the Cam Control Volume VR605 (10 kΩ) in Stop, Fast (F.F. or Rew.), Pause and Playback modes.

(b) Reference Voltage

Reference voltage at the sliding contact of VR605 (Cam Control Volume) in each mode is as follows:

Mode	Reference Voltage (Typical Value)	
Stop	0 V	2.0 V ±0.25 V
Fast (F.F./Rew.)	-2.0 V	
Pause	-6.5 V	2.6 V ±0.4 V
Play	-9.1 V	

(c) Resistors for Adjustment

Mode	Ref. No.	Typical Value
Fast (F.F./Rew.)	R640	22 kΩ
Pause	R643	76.8 kΩ (F)
Play	R639	10 kΩ

(d) Adjustment Procedures

- Set the cassette deck in Stop mode, then check to insure that the voltage at the sliding contact of VR605 is 0 V (±0.3 V).
- Set the cassette deck in F.F. mode, then adjust the value of

R640 so that the voltage at the sliding contact of VR605 will become lower by 2.0 V (±0.25 V) than in Stop mode.

- Press the Pause button to set the cassette deck in Pause mode. Adjust the value of R643 to obtain -6.5 V (+0.4, -0.15 V) at the sliding contact of VR605.
- Set the cassette deck in Playback mode, then adjust the value of R639 so that the voltage at the sliding contact of VR605 will become lower by 2.6 V (±0.4 V) than in Pause mode.

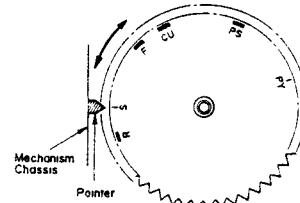


Fig. 2.1

2.2. Reel Motor Speed Adjustment in Play mode

- Connect a DC voltmeter to TP1 and GND on the Logic P.C.B. Ass'y.

- Without loading a cassette tape, set the cassette deck in Play mode.

- Adjust VR601 on the Logic P.C.B. Ass'y to obtain -4 V on the DC voltmeter.

2.3. Record Head and Playback Head Tilt Adjustment

Note: On items 2.3 - 2.9, refer to Fig. 2.2 flow chart.

Refer to Figs. 2.3 and 2.4.

- Load a Tilt Check Gauge M-9039 (DA09039A) in the cassette deck.
- Clip the grounding terminal of the Tilt Check Gauge with one end of the cord with clip, and the chassis of the cassette deck with the other end.
- Remove both of the Height Gears.
- Set the cassette deck in Play mode. Check to insure whether the Beacons Playback Head "Upper" or "Lower" and Record Head "Upper" or "Lower" are illuminating. In order not to give damages onto the head surfaces, push both of slide knobs of the Gauge to the direction of arrow marks, then return them to the original place to be in contact with record head and playback head surfaces after Play mode is securely locked.
- Check to insure freedom from contact between the Gauge and pad lifter.
- Beacon Playback Head "Lower" will light on when height adjustment screw (P) turned clockwise but Playback Head "Upper" when counterclockwise. Adjust so that both "Upper" and "Lower" will light on even when you move the slide knob to the direction of an arrow mark and then return it to the original place.
- Same procedures will apply to the Beacons Record Head "Upper" and "Lower", except for the height adjustment screw (R).
- Set the cassette deck in Stop mode and fit both of the serrated Height Gears. Then set the cassette deck again in Play mode and insure all of the 4 Beacons are illuminating. If not, (3) through (7) will have to be repeated till satisfactory results are obtained.

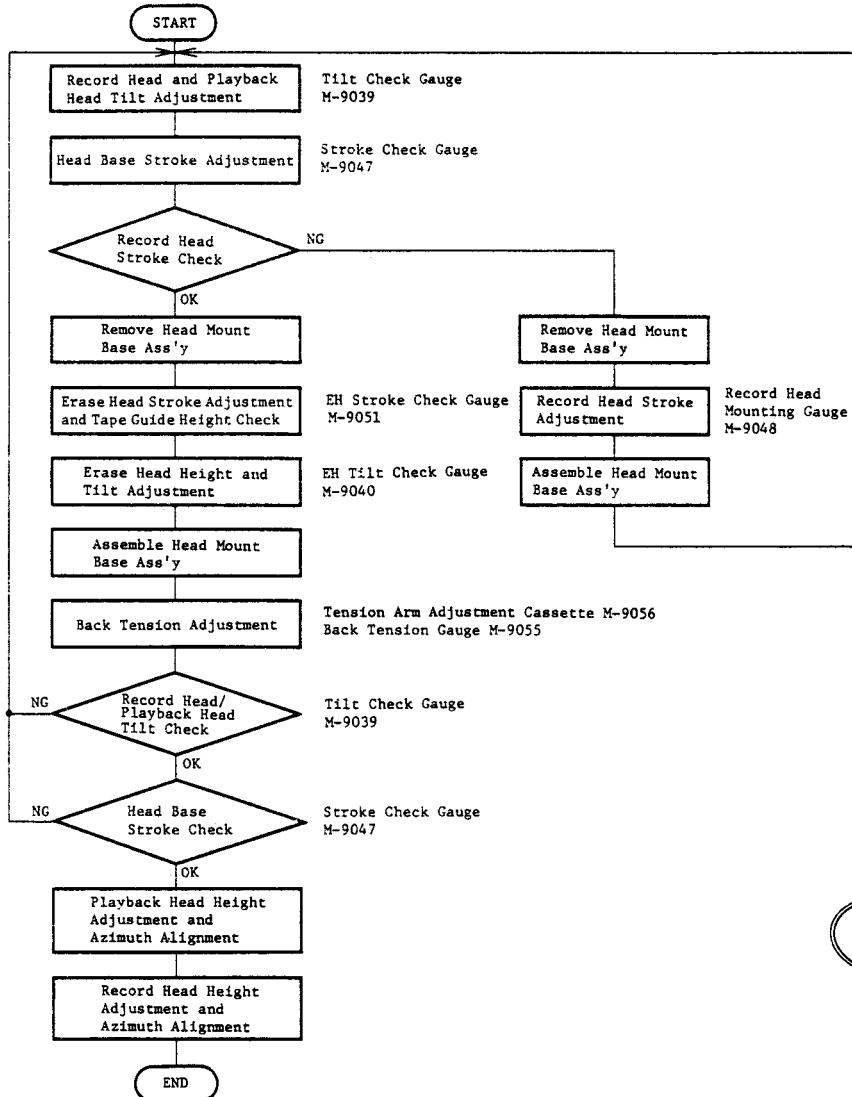


Fig. 2.2

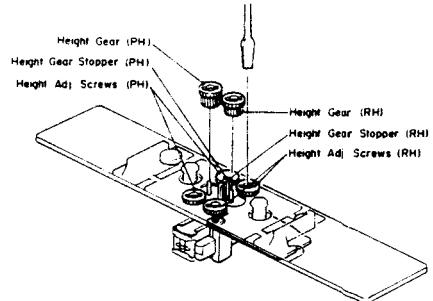


Fig. 2.3

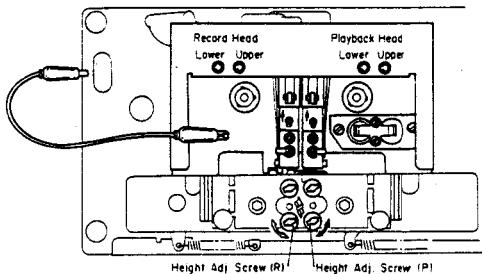


Fig. 2.4

2.4. Head Base Stroke Adjustment

Refer to Fig. 2.5.

Note: Before you conduct this adjustment, adjust with a "Tilt Check Gauge" to insure freedom from tilt on the playback head and record head.

- (1) Head Base Stroke Adjustment in Play Mode
 - (a) Load a Stroke Check Gauge M-9047 (DA09047B) in the cassette deck.
 - (b) Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the cassette deck in Play mode. Then slowly release the Indicators and insure whether each of the Indicators is in contact with record and playback heads.
 - (c) Check to insure whether the "P" pointer on the Playback Head Indicator locates between the 2 lines on the Indicator Plate.
 - (d) If the playback head stroke is noted to be misaligned, adjustment can be made by moving the stroke adjuster assembled in the head base assembly (either forwardly or backwardly).
 - (e) Check to insure whether the "P" pointer on the Playback Head Indicator locates between the 2 lines on the Record Head Indicator, thus check can be made on record head stroke.

(f) If the record head stroke is noted to be misaligned, adjustment can be made with a Record Head Mounting Gauge M-9048 (DA09048A).

- (2) Head Base Stroke Adjustment in Cue Mode
 - (a) Load a Stroke Check Gauge M-9047 (DA09047B) in the cassette deck.
 - (b) Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the cassette deck in Cue mode. Then slowly release the Indicators and insure whether each of the Indicators is in contact with record and playback heads.
 - (c) Check to insure whether the "C" pointer on the Playback Head Indicator locates between the 2 lines on the Indicator Plate.
 - (d) If the playback head stroke is noted to be misaligned, adjust VR602 on the Logic P.C.B. Ass'y till satisfactory results are obtained.
 - (e) After completion of the Head Base Stroke Adjustment, check to insure accuracy of the Head Base Stroke Adjustment in Play mode.
- If the above are inaccurate, items (1) and (2) will have to be repeated till satisfactory results are obtained.

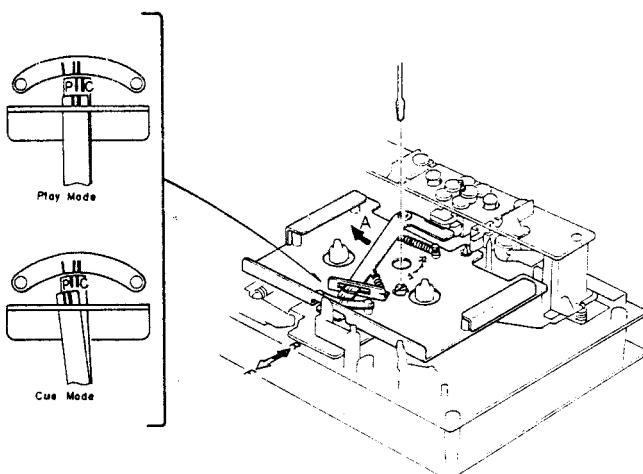


Fig. 2.5

2.5. Erase Head Stroke Adjustment and Tape Guide Height Check

Remove the Head Mount Base Ass'y.
Refer to Figs. 2.6 and 2.7.

(1) Erase Head Stroke Adjustment

- (a) Load an EH Stroke Check Gauge M-9051 (DA09051A) in the cassette deck.
- (b) Set the cassette deck in Play mode, thus check can be made on erase head stroke through the EH Stroke Indicator.
- (c) Check to insure whether the erase head surface is aligned with red line on the EH Stroke Indicator. If not, adjust the erase head stroke by loosening 2 screws A that assemble erase head and erase head plate.
- (d) After completion of adjustment, 2 pcs. of screws shall be locked with lock tight paint.

(2) Supply Tape Guide Height Check

- (a) Load an EH Stroke Check Gauge M-9051 (DA09051A) in the cassette deck.
- (b) Set the cassette deck in Play mode.
- (c) Slide the Supply Tape Guide Check Bar down against the supply tape guide, and check to insure that the Supply Tape Guide Check Bar is accepted by the supply tape guide.

(3) Take-up Tape Guide Height Check

- (a) Load an EH Stroke Check Gauge M-9051 (DA09051A) in the cassette deck.
- (b) Set the cassette deck in Play mode.
- (c) Slide the Take-up Tape Guide Check Bar down against the take-up tape guide, and check to insure that the Take-up Tape Guide Check Bar is accepted by the take-up tape guide.

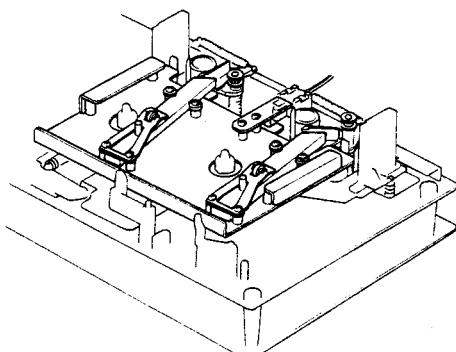


Fig. 2.6

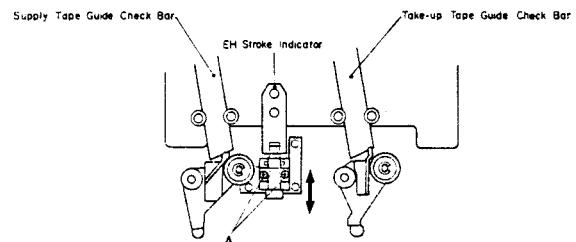


Fig. 2.7

2.6. Erase Head Height and Tilt Adjustment

Refer to Figs. 2.8 and 2.9.

- (1) Remove Head Mount Base Ass'y.
- (2) Load an EH Tilt Check Gauge M-9040 (DA09040A) in the cassette deck.
- (3) Set the cassette deck in Stop mode.
- (4) Check to insure whether one of the 3 Beacons is illuminating. Look down the mirror as shown by an arrow mark and slowly turn the Screw "Height" counterclockwise (or clockwise) so that the two horizontal lines on the mirror will become superposed on the line (in different color) of the erase head, and check to insure whether Beacon "1" is illuminating.
- (5) Turn Screw "Tilt" counterclockwise (or clockwise) to light on Beacon "2". Excessive turning will cause the Beacon "1" to light off. Adjustments of Screw "Tilt" will therefore be conducted till both of the Beacons "1" and "2" illuminate.
- (6) Turn Screw "Azimuth" counterclockwise (or clockwise) to light on Beacon "3". Excessive turning will cause either Beacon "1" or "2" to light off, and therefore adjust Screw "Azimuth" until all of the 3 Beacons "1", "2" and "3" illuminate.
- (7) Check to insure whether the horizontal line on the mirror corresponds to that on the erase head. If not, (4) through (7) will have to be repeated till satisfactory results are obtained.
- (8) After completion of adjustment, 3 pcs. of screws shall be locked with lock tight paint.

Note: Before use of this gauge, check to insure freedom from dust or dirts, or overflow in the groove of the erase head surface.

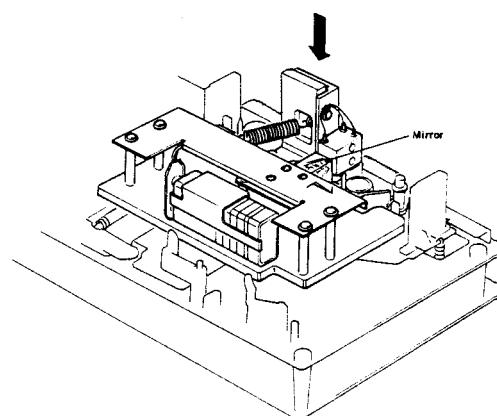


Fig. 2.8

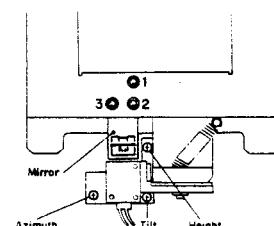


Fig. 2.9

2.7. Back Tension Adjustment

Refer to Figs. 2.10 — 2.13.

- (1) Load a Tension Arm Adjustment Cassette (DA09056A) in the cassette deck referring to Fig. 2.10.
- (2) Set the cassette deck in Play mode.
- (3) Bend the Back Tension Arm with pliers so that the gap between the Cassette Holding Spring assembled on the Head Base Ass'y and the Back Tension Arm becomes 0.5 mm as shown in Fig. 2.11. Do not bend the top of the Back Tension Arm.
- (4) Set the cassette deck in Stop mode, and remove the Tension Arm Adjustment Cassette (DA09056A), then set the cassette deck in Cue mode. In Cue mode, check to insure that the gap is found between the Supply Reel Hub B Ass'y and the Felt of Back Tension Ass'y as shown in Fig. 2.12.
- (5) Load the Back Tension Gauge (DA09055A) in the cassette deck.
- (6) Set the cassette deck in Play mode and read the torque value of Back Tension Gauge. If the value is in a range of 6 g-cm to 10 g-cm, adjustment is not necessary. If not, change the installation point of the Back Tension Spring as shown in Fig. 2.13, and obtain the torque of 7 g-cm to 9 g-cm range.

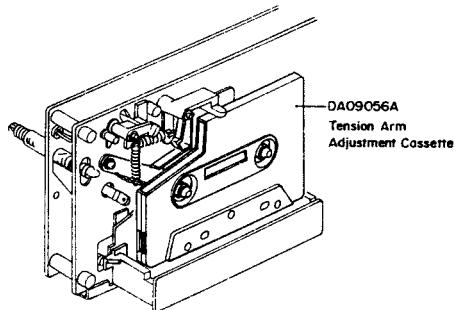


Fig. 2.10

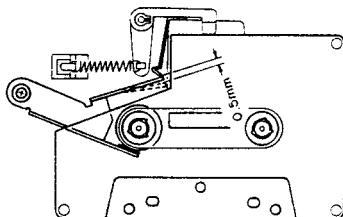


Fig. 2.11

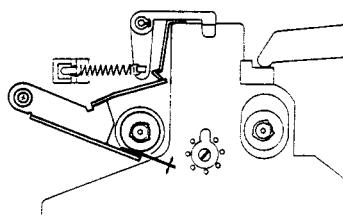


Fig. 2.12

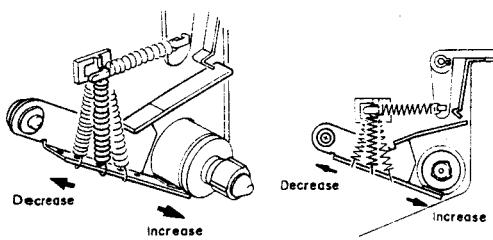


Fig. 2.13

2.8. Playback Head and Record Head Height Adjustment and Azimuth Alignment

Refer to Figs. 2.14 and 2.15. Perform the following adjustments successively.

- (1) **Playback Head Height Adjustment**
 - (a) Set the Monitor switch to Tape, Tape Selector button to ZX and Eq, switch to 70 μ s.
 - (b) Connect a VTVM to Output Jacks.
 - (c) Load a 1 kHz Track Alignment Tape (DA09007B) and set the cassette deck in Forward-Play mode.
 - (d) Turn the PH Height Gear until the outputs of both channels become minimum on the VTVM.
- (2) **Azimuth Reference Position Adjustment**
 - (a) With the Cassette Holder open, press the Forward-Play button. Adjust VR824 on the Auto Azimuth P.C.B. Ass'y so that the Alignment Indicator coincides with the Pointer in the Azimuth Alignment Motor Ass'y. Refer to Fig. 2.15.
 - (b) With the Cassette Holder open, press the Reverse-Play button. Adjust VR823 on the Auto Azimuth P.C.B. Ass'y so that the Alignment Indicator coincides with the Pointer in the Azimuth Alignment Motor Ass'y.
- (3) **Playback Head Azimuth Alignment**
 - (a) Disconnect the Azimuth Motor by pulling out the connector CN-5 of the Auto Azimuth P.C.B. Ass'y.
 - (b) Load a 15 kHz Azimuth Alignment Tape (DA09004B) and set the cassette deck in Forward-Play mode.
 - (c) Turn the PH Azimuth Alignment screw until the outputs of both channels become maximum on the VTVM.
- (4) **Phase Adjustment and Record Head Height Adjustment and Azimuth Alignment**
 - (a) Connect a DC millivoltmeter to pin 1 of CN-5 on the Auto Azimuth P.C.B. Ass'y (CN-5 is removed).
 - (b) Load a 15 kHz Azimuth Alignment Tape (DA09004B) and set the cassette deck in Forward-Play mode. Adjust the VR701 on the Main P.C.B. Ass'y to obtain 0 V on the DC millivoltmeter. (Adjustment should be carried out within approx. 10 seconds.)
 - (c) Turn the Azimuth Alignment Tape upside down and set the cassette deck in Reverse-Play mode. Adjust VR702 on the Main P.C.B. Ass'y to obtain 0 V on the DC millivoltmeter within approx. 10 seconds.
 - (d) Load a Reference ZX Tape (DA09037B) and set the cassette deck in Rec./Forward-Play mode.
 - (e) Press the Level Calibration button to oscillate 400 Hz (0 dB) and turn the RH Height Gear until the outputs of both channels become maximum on the VTVM.
 - (f) Press the Bias Calibration button to oscillate 15 kHz (-20 dB) and turn the RH Azimuth Alignment Screw until the outputs of both channels become maximum on the VTVM.
 - (g) Feed in 5 kHz (-20 dB) from an external generator. Set the cassette deck in Rec./Forward-Play mode and adjust VR822 on the Auto Azimuth P.C.B. Ass'y to obtain the closest value to 0 V on the DC millivoltmeter at pin 1 of CN-5. (Adjustment should be done within approx. 10 seconds.)
 - (h) Mount CN-5 on the original place.
 - (i) Load a 15 kHz Azimuth Alignment Tape (DA09004B) and set the cassette deck in Forward-Play mode. Note the Indicator swing from the Pointer. Turn the Azimuth Alignment Tape upside down, set the cassette deck in Reverse-Play mode and note the Indicator swing from the Pointer. (Indicator will move in the opposite direction as above.) Adjust the PH Azimuth Alignment Screw so that the Pointer swings evenly in Forward-Play and Reverse-Play modes.
 - (j) Load a 15 kHz Azimuth Alignment Tape (DA09004B) and set the cassette deck in Forward-Play mode. Pull out CN-5 of the Auto Azimuth P.C.B. Ass'y after the Direction Indicator has been finished flashing.
 - (k) Press the Bias Calibration button to oscillate 15 kHz (-20 dB) and turn the RH Azimuth Alignment Screw until the outputs of both channels become maximum on the VTVM.
 - (l) Mount CN-5 on the original place.

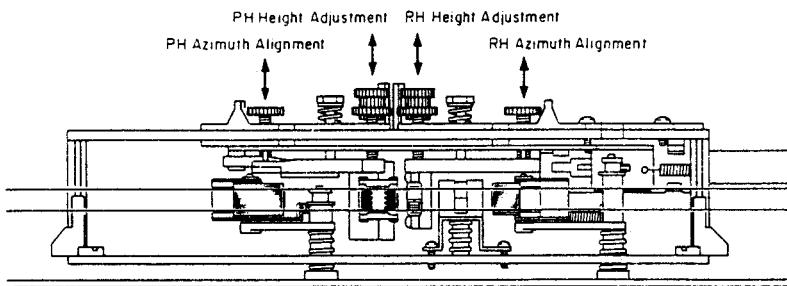


Fig. 2.14

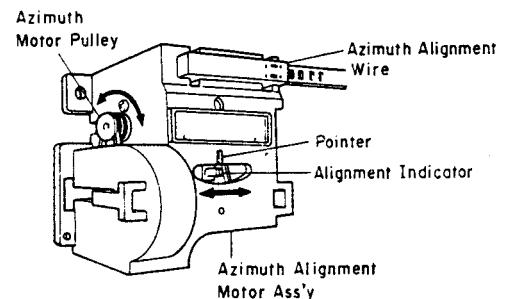


Fig. 2.15

2.9. Record Head Stroke Adjustment

Refer to Figs. 2.16 and 2.17.

Note: This adjustment will be required only to insure freedom from misalignment of the record head stroke in the record head stroke check mode.

- (1) Check the accuracy of the record head stroke.
- (2) Remove Head Mount Base Ass'y.
- (3) Remove the record head assembly.
- (4) Adjustment of Record Head Mounting Gauge M-9048 (DA0-9048A)
 - (a) Mount the Block B onto the Mounting Gauge Plate.
 - (b) Loosen the 2 screws fixing the Block A.
 - (c) As shown in Fig. 2.16, hold the Gauges (0.05 mm and 0.1 mm thickness) between the Block A and Block B, and fix the Block A with screws, pushing the Block A to the 2 guide pins.
- (5) Remove the Block B from the Mounting Gauge Plate.
- (6) As shown in Fig. 2.17, mount the R-8L record head assembly onto the Mounting Gauge Plate, then check the location of the R-8L record head surface. (If record head touches the Block C, loosen 2 pcs. of screws that assemble record head and record head plate, then place the R-8L record head assembly onto the Plate.)
- (7) Remove the R-8L record head assembly from the Mounting Gauge Plate.
- (8) Readjustment of Record Head Mounting Gauge M-9048 (DA09048A)
 - (a) Mount the Block B onto the Mounting Gauge Plate.
 - (b) Loosen the 2 screws fixing the Block A.
 - (c) As shown in Fig. 2.16, hold the Gauges (0.05 mm and either one of 0.05, 0.15, 0.2, 0.25, 0.3 or 0.35 mm thickness) between the Block A and Block B, and fix the Block A with screws, pushing the Block A to the 2 guide pins.
- (9) Remove the Block B from the Mounting Gauge Plate.
- (10) Mount the R-8L record head assembly onto the Mounting Gauge Plate.
- (11) As shown in Fig. 2.17, loosen 2 pcs. of screws that assemble record head and record head plate.
As the location of the Block A is secured by the item (8)-(c), push the record head to the directions A and B, then tighten 2 pcs. of screws.
- (12) Check to insure freedom from gap between the Block C and record head surface, then tighten the 2 pcs. of screws on the record head assembly with lock tight paint.
- (13) Remove the R-8L record head assembly from the Mounting Gauge Plate.
- (14) Assemble the record head assembly to the head mount base assembly.
- (15) Assemble the head mount base assembly to the mechanism assembly.
- (16) Check the record head stroke.
If the above are inaccurate, items (1) through (16) will have to be repeated till satisfactory results are obtained.

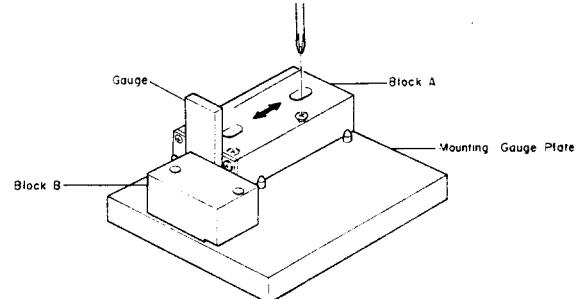
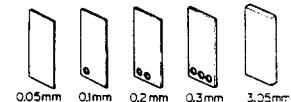


Fig. 2.16

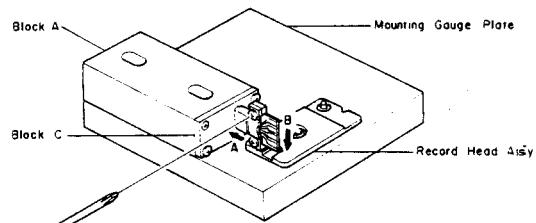


Fig. 2.17

2.10. Tape Travelling Adjustment

The adjustment shall be made with a modified version of the current type EXII C-90 as shown in Fig. 2.18 (error will be made if a current type Tape Travelling Cassette (DA09011A) should be used for this purpose).

While modifying an EXII C-90, the tape guides in the cassette housing shall be kept protected to avoid tilt.

Check shall be made in the following procedures.

- (1) An EXII C-90 tape thus modified shall be loaded onto the cassette deck.
- (2) Release the back-tension (rotate the Supply Reel and feed out some length of tape) and set the cassette deck in Play mode.
- (3) In this juncture, check to insure whether the tape is free from wavering or slippage from the tape guide.
- (4) When the modified EXII C-90 is played back, check to insure whether the tape is freedom from wavering from head surface or at pressure rollers.
- (5) If either of wavering or slippage from the tape guide should be noted, adjustments of items 2.3 to 2.9, etc. will be required. As a case may be, the said wavering or slippage may have been caused from defective Supply Pressure Roller Ass'y or Take-up Pressure Roller Ass'y without parallel contact with capstans. If such are noted, the Pressure Roller Assemblies will have to be replaced.

Further, excessively weak take-up torque or strong take-up torque may cause defective tape travelling.

The cassette deck is intended to be an adjustment-free model, however if the similar matters as above should be noted, please replace the Reel Hub Ass'y to obtain appropriate take-up torque.

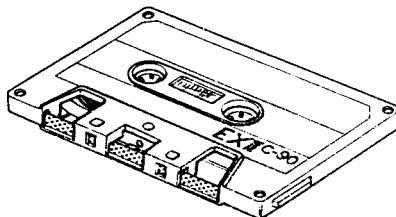


Fig. 2.18

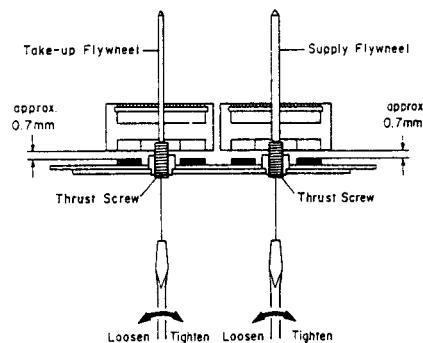


Fig. 2.19

2.11. Flywheel Ass'y Height Adjustment

Refer to Fig. 2.19.

- (1) Adjust both Thrust Screws so that the gaps between the Motor Coil Assemblies and the Flywheel Assemblies become approx. 0.7 mm.
 - (2) Connect a synchroscope to CN501-1 (take-up side) and CN502-1 (supply side) on the Motor Control P.C.B. Ass'y. Set the synchroscope to AC input.
 - (3) Check to insure that the peak-to-peak levels of both waveforms are greater than 20 mV.
 - (4) Apply a quantity of lock tight paint to the Thrust Screws.
- Note: Mount washers on the Flywheel Ass'y as follows if Flywheel Ass'y is replaced.
- (a) Turn the Thrust Screw so that the gap between the Motor Coil Ass'y and the Flywheel Ass'y becomes approx. 1 mm.
 - (b) From the front side of the cassette deck, first insert a Washer 3.1 mm FT into the capstan shaft of supply side (Washer 2.6 mm FT for take-up side), then insert a Washer 3 mm (Washer 2.5 mm) into the shaft and press it until the Washer 3.1 mm FT (Washer 2.6 mm FT) contacts with the flange sufficiently. Refer to Fig. 5.5.
 - (c) Perform the "Flywheel Ass'y Height Adjustment" in item 2.11.

2.12. Lubrication

This is a lubrication-free cassette deck except when parts are replaced. Apply the following lubricant for each replaced part:

- (1) LAUNA #100
Capstan Shaft
Pressure Roller Shaft
Thrust Cap
- (2) FLOIL GB-TS-1
Reel Hub Shaft
Thrust portion on the Capstan Shaft
FLOIL GB-TS-1, made by Kanto Chemicals Co., Ltd. in Japan.
We suggest that you use the above or equivalent type. If unavailable please contact Kanto Chemicals Co., Ltd., 2-7 Kanda Suda-cho Chiyoda-ku, Tokyo 101 Japan.
- (3) Silicon Oil #3000 CST
Air Damper Piston
Note: Excessive lubrication may cause defective damper action as the 0.2ϕ hole at the end of the cylinder may be filled with oil.

3. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT

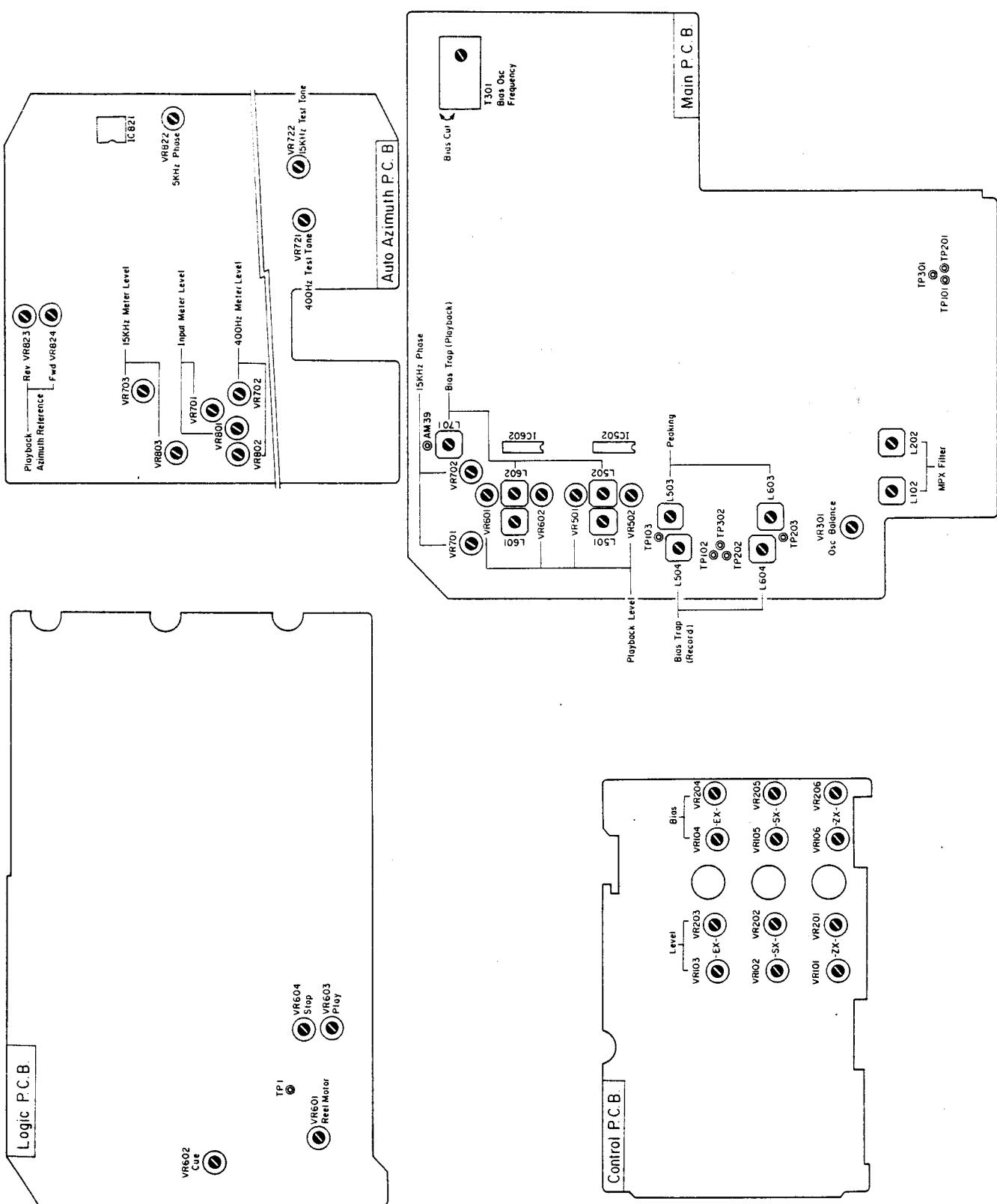


Fig. 3

4. ELECTRICAL ADJUSTMENTS AND MEASUREMENTS

Note: Electrical adjustment should be performed after mechanical adjustment is completed.

4.1. Adjustment and Measurement Instructions

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST-MENT	REMARKS
1	Tone Level Calibration	Tone 400 Hz and 15 kHz	VTVM to TP101, TP201 on Main P.C.B. and Output Jacks	Tone — 400 Hz/ 15 kHz Monitor SW — Source	Auto Azimuth P.C.B. VR721 (400 Hz) VR722 (15 kHz) Main P.C.B. VR301 (400 Hz Balance)	<ol style="list-style-type: none"> Press the Level Calibration button to oscillate 400 Hz. Adjust VR721 to obtain 350 mV on the VTVM at TP101 (L ch). Adjust VR301 to obtain the same level as L ch at TP201. Measure the reading on the VTVM at the Output Jacks. Press the Bias Calibration button to oscillate 15 kHz. Adjust VR722 to obtain 20 dB lower level than in 4 on the VTVM at the Output Jacks. Press the Calibration Reset button to stop the tone oscillation.
2	Meter Level Calibration	400 Hz to Input Jacks and Tone 400 Hz and 15 kHz	VTVM to TP101, TP201 on Main P.C.B.	Tone — OFF/400 Hz/ 15 kHz Monitor SW — Source	Auto Azimuth P.C.B. VR701, VR801 VR702, VR802 VR703, VR803 VR721 (400 Hz) VR722 (15 kHz)	<ol style="list-style-type: none"> Feed in 400 Hz, then adjust the Input level controls to obtain 350 mV —0.9 dB on the VTVM. Adjust VR701 (VR801) so that the 0 dB segment of the level meter starts illuminating. Press the Level Calibration button to oscillate 400 Hz, then adjust VR721 to obtain 350 mV —0.25 dB on the VTVM. Adjust VR702 (VR802) so that the 0 dB segment of the level meter starts illuminating. Press the Bias Calibration button to oscillate 15 kHz, then adjust VR722 to obtain 35 mV —0.25 dB on the VTVM. Adjust VR703 (VR803) so that the 0 dB segment of the level meter starts illuminating. Press the Calibration Reset button. Re-adjust the tone level according to step 1 "Tone Level Calibration".
3	MPX Filter Adjustment	19 kHz ±100 Hz to Input Jacks	VTVM to Output Jacks	Monitor SW — Source Dolby NR SW — OFF MPX SW — ON	Main P.C.B. L102, L202	<ol style="list-style-type: none"> Turn the Output level control fully clockwise (maximum position). Adjust the Input Level controls to obtain 1 V on the VTVM. Set the MPX Filter switch to ON, then adjust L102 (L202) to obtain the minimum reading on the VTVM (the minimum reading will be less than —30 dB).
4	Playback Head and Record Head Height Adjustment and Azimuth Alignment	1 kHz Track Alignment Tape (DA09007B) 15 kHz Azimuth Tape (DA09004B) 5 kHz (—20 dB) to Input Jacks	VTVM to Output Jacks and DC Millivoltmeter to pin 1 of CN-5 on Auto Azimuth P.C.B. Tone 15 kHz	Playback (Fwd./Rev.) Record, Playback (Fwd.) Monitor SW — Tape Tape SW — ZX Eq. SW — 70 µs Dolby NR SW — OFF MPX SW — OFF	PH Height Gear PH Azimuth Alignment Screw RH Height Gear RH Azimuth Alignment Screw Auto Azimuth P.C.B. (Fwd. Azimuth Ref.) VR824 (Rev. Azimuth Ref.) VR823 (5 kHz Phase) VR822 Main P.C.B. (15 kHz Fwd. Phase) VR701 (15 kHz Rev. Phase) VR702	<p>Perform the following adjustments successively.</p> <ol style="list-style-type: none"> Playback Head Height Adjustment <ol style="list-style-type: none"> Load a 1 kHz track alignment tape (DA09007B) and forward-play it back. Adjust the PH Height Gear to obtain minimum readings of both channels on the VTVM. Azimuth Reference Position Adjustment <ol style="list-style-type: none"> With the Cassette Holder open, press the Forward-Play button. Adjust VR824 on the Auto Azimuth P.C.B. Ass'y so that the Alignment Indicator coincides with the Pointer in the Azimuth Alignment Motor Ass'y. Refer to Fig. 2.15. With the Cassette Holder open, press the Reverse-Play button. Adjust VR823 on the Auto Azimuth P.C.B. Ass'y so that the Alignment Indicator coincides with the Pointer in the Azimuth Alignment Motor Ass'y. Playback Head Azimuth Alignment <ol style="list-style-type: none"> Disconnect the Azimuth Motor by pulling out the connector CN-5 of the Auto Azimuth P.C.B. Ass'y. Load a 15 kHz azimuth tape (DA09004B) and forward-play it back. Adjust the PH Azimuth Alignment Screw to obtain maximum readings of both channels on the VTVM. Phase Adjustment and Record Head Height Adjustment and Azimuth Alignment <ol style="list-style-type: none"> Disconnect CN-5 of the Auto Azimuth P.C.B. Ass'y. Load a 15 kHz azimuth tape (DA09004B) and forward-play it back. Adjust VR701 on the Main P.C.B. Ass'y to obtain 0 V on the DC millivoltmeter. (Adjustment should be carried out within approx. 10 seconds.) <p>(to be continued)</p>

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST-MENT	REMARKS
4 (continued)						<p>c. Turn the azimuth tape upside down and reverse-play it back. Adjust VR702 on the Main P.C.B. Ass'y to obtain 0 V on the DC millivoltmeter within approx. 10 seconds.</p> <p>d. Load a reference ZX tape (DA09037B) and record/forward-play it back.</p> <p>e. Press the Level Calibration button to oscillate 400 Hz (0 dB) and adjust the RH Height Gear to obtain maximum readings of both channels on the VTVM.</p> <p>f. Press the Bias Calibration button to oscillate 15 kHz (-20 dB) and adjust the RH Azimuth Alignment Screw to obtain maximum readings of both channels on the VTVM.</p> <p>g. Feed in 5 kHz (-20 dB) from an external generator and record/forward-play it back. Adjust VR822 on the Auto Azimuth P.C.B. Ass'y to obtain the closest value to 0 V on the DC millivoltmeter. (Adjustment should be done within approx. 10 seconds.)</p> <p>h. Mount CN-5 on the original place.</p> <p>i. Load a 15 kHz azimuth tape (DA09004B) and forward-play it back. Note the Indicator swing from the Pointer. Turn the azimuth tape upside down, reverse-play it back and note the Indicator swing from the Pointer. (Indicator will move in the opposite direction as above.) Adjust the PH Azimuth Alignment Screw so that the Pointer swings evenly in Forward-Play and Reverse-Play modes.</p> <p>j. Load a 15 kHz azimuth tape (DA09004B) and forward-play it back. Pull out CN-5 of the Auto Azimuth P.C.B. Ass'y after the Direction Indicator has been finished flashing.</p> <p>k. Press the Bias Calibration button to oscillate 15 kHz (-20 dB) and adjust the RH Azimuth Alignment Screw to obtain maximum readings of both channels on the VTVM.</p> <p>l. Mount CN-5 on the original place.</p>
5	Playback Level Calibration	400 Hz Level Tape (DA09005B)	VTVM to TP101, TP201 on Main P.C.B.	Playback (Fwd./Rev.) Monitor SW — Tape Eq. SW — 70 µs Dolby NR SW — OFF MPX SW — OFF	Main P.C.B. VR501, VR601 (Fwd.) VR502, VR602 (Rev.)	<p>1. Load a 400 Hz level tape and forward-play it back.</p> <p>2. Adjust VR501 (VR601) to obtain 350 mV on the VTVM.</p> <p>3. Turn the tape upside down and reverse-play it back.</p> <p>4. Adjust VR502 (VR602) to obtain 350 mV on the VTVM.</p>
6	Playback Frequency Response Adjustment	400 Hz Level Tape (DA09005B) 10 kHz PB Frequency Response Tape (DA09003B) 15 kHz PB Frequency Response Tape (DA09002B) 20 kHz PB Frequency Response Tape (DA09001B)	VTVM to Output Jacks	Playback (Fwd./Rev.) Monitor SW — Tape Tape SW — SX Eq. SW — 70 µs Dolby NR SW — OFF MPX SW — OFF	Main P.C.B. (Fwd.) R507, R607 R508, R608 (Rev.) R517, R617 R518, R618	<p>1. Load a 400 Hz level tape and forward-play it back. Adjust the Output level control to a certain level (0 dB for example).</p> <p>2. Load 10 kHz, 15 kHz and 20 kHz PB frequency response tapes and forward-play them back. Short R507 (R607) or R508 (R608) to obtain the following levels against the level for the 400 Hz level tape. 10 kHz: -20 dB -1 dB to +2 dB 15 kHz: -20 dB -1 dB to +3 dB 20 kHz: -20 dB -1 dB to +4 dB</p> <p>3. Turn the tape upside down and reverse-play them back. Short R517 (R617) or R518 (R618) to obtain the levels which suffice the range specified in above 2.</p> <p>4. Refer to "Playback Frequency Response Adjustment" in item 4.2 for the detailed description.</p>
7	Bias Oscillation Frequency and Erase Current Adjustment		VTVM across the additional 0.1 Ω resistor and Frequency Counter to CN1-1, on Main P.C.B.	Record, Pause Monitor SW — Source Tape SW — ZX Eq. SW — 70 µs Dolby NR SW — OFF MPX SW — OFF	Main P.C.B. T301 R313, R314	<p>1. Connect an additional 0.1 Ω resistor in series to the Erase Head, then connect a VTVM across it.</p> <p>2. Adjust T301 to obtain 105 kHz on the frequency counter.</p> <p>3. Check the erase current by the VTVM. Erase current will be in a range of 310 mA to 400 mA (typically approx. 350 mA). If erase current is not sufficient, increase it by shorting R313 or R314.</p> <p>4. After completion of the erase current adjustment, re-check the bias oscillation frequency.</p> <p>5. Remove the additional 0.1 Ω resistor.</p>

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST-MENT	REMARKS
8	Record Amplifier Equalizer Adjustment	23 kHz (-20 dB) to Input Jacks	VTVM to TP102, TP202 on Main P.C.B.	Record, Pause Monitor SW — Source Tape SW — ZX Eq. SW — 70 µs Dolby NR SW — OFF MPX SW — OFF	Main P.C.B. L503, L603	<ol style="list-style-type: none"> 1. Remove the bias-cut jumper from the dip side of the Main P.C.B. Ass'y. 2. Adjust L503 (L603) to obtain approx. +16 dB at 23 kHz on the VTVM. 3. Re-solder the bias-cut jumper.
9	Bias Trap Adjustment (Record Amp.)	Remove input signals	VTVM to TP103, TP203 on Main P.C.B.	Same as above	Main P.C.B. L504, L604	Adjust L504 (L604) to obtain minimum reading on the VTVM.
10	Bias Trap Adjustment (Playback Amp.)	Remove input signals	VTVM to IC502-3, IC602-3 (Fwd. Playback Amp.), IC502-1, IC602-1 (Rev. Playback Amp.) and AM39 (Sub Playback Amp.)	Same as above	Main P.C.B. L501, L502 L601, L602 L701	<ol style="list-style-type: none"> 1. Adjust L501 (L601) to obtain minimum reading on the VTVM at IC502-3 (IC602-3). 2. Adjust L502 (L602) to obtain minimum reading on the VTVM at IC502-1 (IC602-1). 3. Adjust L701 to obtain minimum reading on the VTVM at terminal AM39.
11	Record Level Calibration and Recording Bias Current Adjustment	Tone 400 Hz and 15 kHz and 10 kHz/20 kHz (-20 dB) to Input Jacks	VTVM and Distortion Meter to Output Jacks	Record, Playback (Fwd.) Tone — 400 Hz / 15 kHz Monitor SW — Tape Tape SW — ZX/SX EX Eq. SW — 70 µs (ZX/SX) 120 µs (EX) Dolby NR SW — C-Type/B-Type/ OFF MPX SW — OFF	Control P.C.B. (Level) ZX: VR101, VR201 SX: VR102, VR202 EX: VR103, VR203 (Bias) ZX: VR106, VR206 SX: VR105, VR205 EX: VR104, VR204	<p>Adjustment should be made in the order of ZX, SX and EX.</p> <ol style="list-style-type: none"> 1. Set the Dolby NR switch to C-Type. 2. Load a reference ZX tape (DA09037B), reference SX tape (DA09025B) and reference EXII tape (DA09066B). 3. Adjust the Sensitivity controls VR101 (VR201) for ZX, VR102 (VR202) for SX and VR103 (VR203) for EXII to maximum position. 4. Adjust the Bias controls VR106 (VR206) for ZX, VR105 (VR205) for SX and VR104 (VR204) for EXII to maximum position. 5. Press the Record and Fwd. Play buttons, then press the Level Calibration button to oscillate 400 Hz. 6. Adjust the Sensitivity controls VR101 (VR201), VR102 (VR202) and VR103 (VR203) to obtain 0 dB on the level meters. 7. Press the Bias Calibration button to oscillate 15 kHz. 8. Adjust the Bias controls VR106 (VR206), VR105 (VR205) and VR104 (VR204) to obtain 0 dB on the level meters. 9. Repeat 5 to 8 as above two or three times to obtain optimum performance. 10. Set the Dolby NR switch to B-Type/OFF. 11. Feed in 10 kHz (-20 dB) and 20 kHz (-20 dB), then record and forward-play them back. <p>Check to insure that the levels are within -20 dB ±2 dB against the levels in Dolby NR C-Type.</p> <p>12. Check to insure whether the total harmonic distortion is less than 0.8% for ZX tape and 1.0% for SX and EXII tapes.</p>
12	Overall Frequency Response Adjustment	400 Hz (0 dB) and 20 Hz to 20 kHz (-20 dB) to Input Jacks	VTVM to Output Jacks	Record, Playback (Fwd.) Monitor SW — Source/ Tape Tape SW — ZX/SX/EX Eq. SW — 70 µs (ZX/SX) 120 µs (EX) Dolby NR SW — OFF MPX SW — OFF	Main P.C.B. L503, L603	<ol style="list-style-type: none"> 1. Set the Monitor switch to Source. 2. Feed in 400 Hz (0 dB) and adjust the input level controls to obtain 0 dB on the level meters. 3. Switch the Generator output level to -20 dB. 4. Set the Monitor switch to Tape, then record and forward-play it back. 5. Feed in 20 Hz to 20 kHz (-20 dB), and check to insure whether the output levels are within -20 dB ±3 dB. 6. If above is not sufficient, adjust L503 (L603) to obtain approx. -20 dB on the VTVM at 20 kHz. 7. Conduct step 11 "Record Level Calibration and Recording Bias Current Adjustment". 8. If above is not sufficient further, precise re-adjustment of step 6 "Playback Frequency Response", replacement of Playback Head or Record Head, check on item 2.10 "Tape Travelling Adjustment" or frequency response adjustment according to item 4.2 will be required.
13	Crosstalk Measurement	1 kHz to Input Jacks	1 kHz Band Pass Filter and VTVM to Output Jacks	Record and Playback (Fwd.) Monitor SW — Tape Tape SW — ZX Eq. SW — 70 µs Dolby NR SW — OFF		<ol style="list-style-type: none"> 1. Erase a reference ZX tape with a bulk eraser. 2. Load the reference tape and adjust the input level controls to obtain 0 dB on the level meters. 3. Record input signals on the tape with pressing the Record and Fwd. Play buttons. 4. Press the Stop button, then reverse-play it back with pressing Rev. Play button. 5. Measure the difference between 3 and 4. (to be continued)

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
13 (continued)						<p>6. Record input signals on the tape but not on the portion used as above.</p> <p>7. Turn the tape the other way round and forward-play it back.</p> <p>8. Measure the output level difference between 6 and 7.</p>
14	Channel Separation Measurement	1 kHz to Input Jacks	1 kHz Band Pass Filter and VTVM to Output Jacks	Record and Playback (Fwd.) Monitor SW — Tape Tape SW — ZX Eq. SW — 70 µs Dolby NR SW — OFF		<p>1. Erase a reference ZX tape with a bulk eraser.</p> <p>2. Load the reference tape and adjust the L ch (R ch) Input level control to obtain 0 dB on the level meter.</p> <p>Close the R ch (L ch) Input level control.</p> <p>3. Record and forward-play the input signals and measure the R ch (L ch) level on the VTVM.</p> <p>4. Turn the tape the other way round and reverse-play it back.</p> <p>5. Measure the R ch (L ch) level on the VTVM.</p>
15	Signal to Noise Ratio Measurement	400 Hz to Input Jacks	VTVM and Distortion Meter to Output Jacks	Record and Playback (Fwd.) Monitor SW — Tape Tape SW — ZX Eq. SW — 70 µs Dolby NR SW — B-Type/C-Type		<p>1. Feed in 400 Hz and record and forward-play it back.</p> <p>2. Adjust the Input level controls to obtain a 3% total harmonic distortion in Playback mode.</p> <p>3. Close the Input level controls, then record again.</p> <p>After rewound, forward-play back and check the output level difference between 3 and 4.</p> <p>Note: The filter of IHF-A curve shall be used in the measurements.</p>
16	Total Harmonic Distortion Measurement	400 Hz to Input Jacks	Distortion Meter to Output Jacks	Record and Playback (Fwd.) Monitor SW — Tape Tape SW — ZX/SX/EX Eq. SW — 70 µs (ZX/SX) 120 µs (EX) Dolby NR SW — OFF		<p>1. Adjust the Input level controls to obtain 0 dB on the level meters.</p> <p>2. Record and forward-play it back.</p> <p>3. Read the distortion meter and check to insure that the distortion is less than 0.8% for ZX tape and 1.0% for SX and EXII tapes.</p>
17	Wow/Flutter & Speed Measurement	3 kHz Speed and Wow/Flutter Tape (DA09006C)	Wow/Flutter Meter to Output Jacks	Playback Monitor SW — Tape Eq. SW — 70 µs		Forward-play back and read the wow/flutter meter.

4.2. Frequency Response Adjustment

(1) Playback Frequency Response Adjustment

Refer to Figs. 4.2.1 and 4.2.2.

Peaking adjustment will be required if playback level is not sufficient when 20 kHz PB frequency response tape is played back as referred to step 6 in 4.1 "Adjustment and Measurement Instructions".

The adjustment will compensate the gap loss of the playback head.

Peaking level is varied by the short circuit of the following resistors in the playback amp. circuit of the Main P.C.B. Ass't.

Forward Playback Amp.:

Fwd.: R507 (220 ohms) or R508, R608 (470 ohms)

Reverse Playback Amp.:

Rev.: R517, R617 (220 ohms) or R518, R618 (470 ohms)

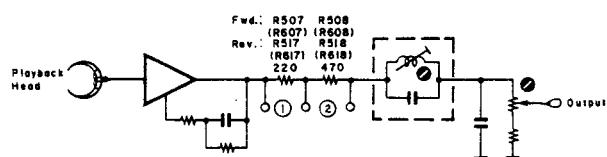


Fig. 4.2.1

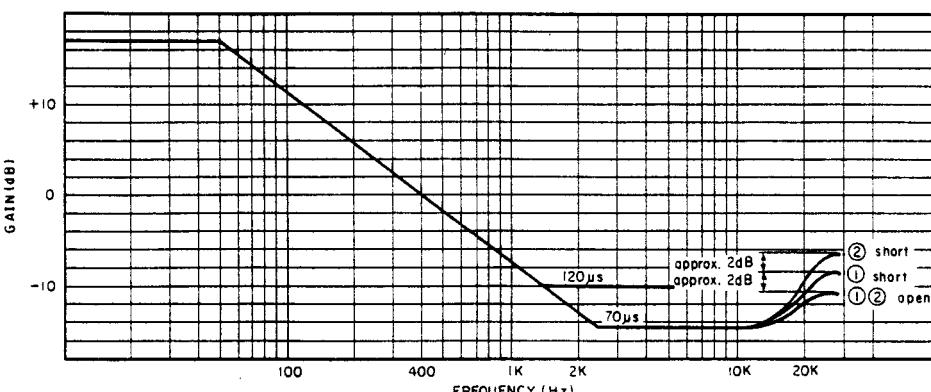


Fig. 4.2.2

- (2) Record Current Frequency Response Adjustment
 Record eq. peaking is adjusted for compensating the overall frequency response when playback frequency response is completed.
 Normally however peaking frequency is pre-adjusted to approx. 23 kHz in Record mode. Refer to Fig. 4.2.3.

- (a) For ZX Tape
 1) Feed in 400 Hz (0 dB), then record and play it back. Adjust bias current by VR106 (VR206) on the Control P.C.B. Ass'y to obtain 0.8% distortion.

- 2) Feed in 10 kHz and 400 Hz (-20 dB), then record and play them back.
 Check the difference of the levels between 10 kHz and 400 Hz, and mount an additional capacitor in parallel with C126 (C226) on the Main P.C.B. Ass'y from the dip side of the printed circuit board depending upon the difference of the levels against 400 Hz. Refer to Fig. 4.2.4.

Level Difference	Addition	Total
0 dB	0	820 pF
-1 dB	220 pF	1040 pF

- 3) Feed in 22 kHz (-20 dB), then record and play it back. Adjust record peaking coil L503 (L603) on the Main P.C.B. Ass'y to obtain flat overall frequency response.

- (b) For SX Tape
 1) Feed in 15 kHz and 400 Hz (-20 dB), then record and play them back.
 Adjust bias current by VR105 (VR205) on the Control P.C.B. Ass'y to obtain flat overall frequency response.
- 2) Feed in 20 kHz and 400 Hz (-20 dB), then record and play them back.
 And check to insure that the overall frequency response is flat.

- (c) For EXII Tape
 1) Feed in 15 kHz and 400 Hz (-20 dB), then record and play them back.
 Adjust bias current by VR104 (VR204) on the Control P.C.B. Ass'y to obtain flat overall frequency response.
- 2) Feed in 20 kHz and 400 Hz (-20 dB), then record and play them back.
 And check to insure that the overall frequency response is flat.

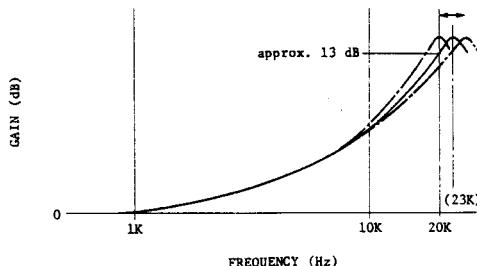


Fig. 4.2.3

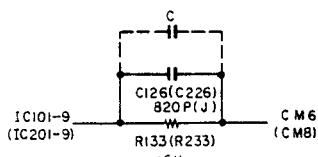


Fig. 4.2.4

4.3. Dolby NR Circuit Check

Dolby NR circuit incorporates Dolby NR ICs which have no adjustment point.
 Perform the following checks and make sure that the IC operates accurately, i.e., accuracy of frequency response through IC.

4.3.1. Dolby NR B-Type Circuit Check

(1) Playback Dolby NR Circuit

Signal Source: 1.4 kHz to negative side of C131 (C231) on Main P.C.B.

Output Connection: VTVM to TP101 (TP201) on Main P.C.B.

Mode: Stop

Monitor SW — Tape

Dolby NR SW — B-Type/OFF

- (a) Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.

- (b) Set the Dolby NR switch to B-Type.

Feed in 1.4 kHz and adjust the generator output control to obtain 35 mV on the VTVM.

- (c) Set the Dolby NR switch to OFF.

Check to insure that the reading is +3.2 dB ±1.5 dB on the VTVM.

(2) Record Dolby NR Circuit

Signal Source: 1.4 kHz to Input Jacks

Output Connection: VTVM to TP101 (TP201) and CM6 (CM8) on Main P.C.B.

Mode: Stop

Monitor SW — Source

Dolby NR SW — B-Type/OFF

- (a) Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.

(b) Feed in 1.4 kHz and adjust the Input Level controls to obtain 35 mV/11.1 mV on the VTVM.

- (c) Remove the VTVM from TP101 (TP201) and reconnect it to CM6 (CM8) on the Main P.C.B. Ass'y.

(d) Check to insure that the reading at CM6 (CM8) corresponds to the following with Dolby NR switch OFF and B-Type.

Input Level at TP101, TP201	Level at CM6, CM8	
	Dolby NR OFF	Dolby NR B-Type
35 mV	0 dB	+3.2 dB ±1.5 dB
11.1 mV	0 dB	+8.2 dB ±1.5 dB

4.3.2. Dolby NR C-Type Circuit Check

(1) Playback Dolby NR Circuit

Signal Source: 1.4 kHz to negative side of C131 (C231) on Main P.C.B.

Output Connection: VTVM to TP101 (TP201) on Main P.C.B.

Mode: Stop

Monitor SW — Tape

Dolby NR SW — C-Type/OFF

- (a) Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.

(b) Set the Dolby NR switch to C-Type.
 Feed in 1.4 kHz and adjust the generator output control to obtain 35 mV on the VTVM.

- (c) Set the Dolby NR switch to OFF.

Check to insure that the reading is +6.5 dB ±1.5 dB on the VTVM.

(2) Record Dolby NR Circuit

Signal Source: 1.4 kHz to Input Jacks

Output Connection: VTVM to TP101 (TP201) and CM6 (CM8) on Main P.C.B.

Mode: Stop

Monitor SW — Source

Dolby NR SW — C-Type/OFF

- (a) Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.

(b) Feed in 1.4 kHz and adjust the Input Level controls to obtain 35 mV/11.1 mV on the VTVM.

- (c) Remove the VTVM from TP101 (TP201) and reconnect it to CM6 (CM8) on the Main P.C.B. Ass'y.

(d) Check to insure that the reading at CM6 (CM8) corresponds to the following with Dolby NR switch OFF and C-Type.

Input Level at TP101, TP201	Level at CM6, CM8	
	Dolby NR OFF	Dolby NR C-Type
35 mV	0 dB	+6.5 dB ±1.5 dB
11.1 mV	0 dB	+11.4 dB ±1.5 dB

5. MECHANISM ASS'Y AND PARTS LIST

5.1. Synthesis

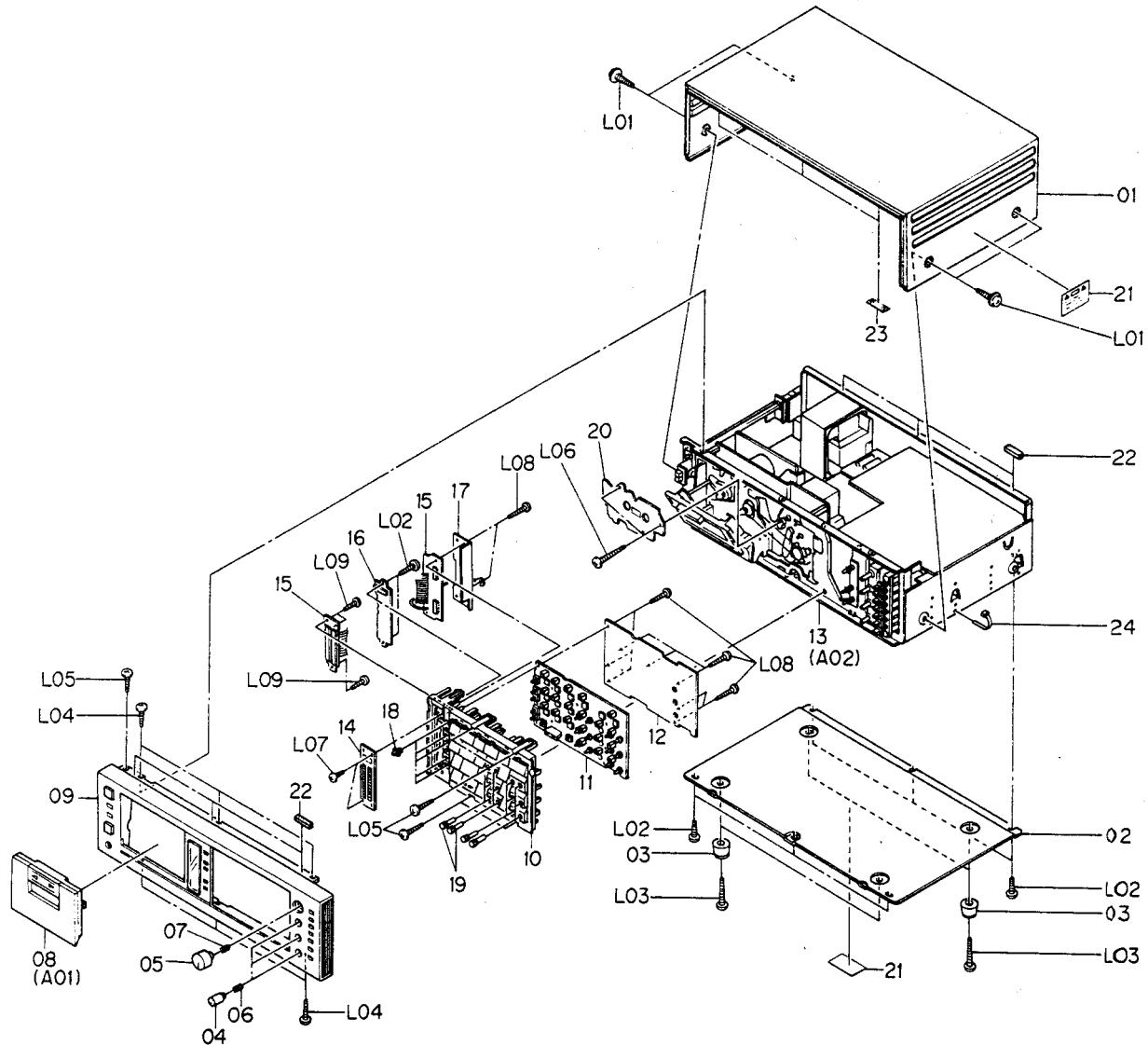


Fig. 5.1

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
	HA04393A	Synthesis (Japan)	1	14	OH04198A	Meter Cover	1
	HA04392A	Synthesis (U.S.A. & Canada)	1	15	BA04893A	Indicator P.C.B. Ass'y	1
	HA04396A	Synthesis (220V Class 2)	1	16	BA04894A	Counter P.C.B. Ass'y	1
	HA04391A	Synthesis (UK)	1	17	OJ04698B	Shield Plate	1
	HA04395A	Synthesis (Australia)	1	18	OH04180A	Function Button	5
	HA04394A	Synthesis (Others)	1	19	OH04204A	Calibration Volume Knob	12
		Serial No.: A80101001 -		20	HA04422A	Cover Plate	1
01	OH04010A	Top Cover	1	21	OM04377A	Caution Label (U.S.A. & Canada)	2
02	OJ04652A	Bottom Cover	1	22	OJ04550A	Top Cover Cushion	6
03	OJ03564A	Leg T-H	4	23	OJ04080A	Top Cover Himmelon	3
04	OH04203A	Volume Knob	3	24	OB08515A	Insu-Lock	1
05	OH04202A	Master Volume Knob	1	L01	OE03032A	BT 4x8 @ Pan (Washer Faced)	4
06	OH03737A	Volume Knob Base	3	L02	OE00857A	BT 3x6 @ Binding	8
07	OH03739A	Master Volume Knob Base	1	L03	OE00865A	BT 3x10 @ Binding	4
08	HA04401A	Cassette Lid Ass'y	1	L04	OE00921A	BT 3x8 @ Binding (Black Chromate)	6
09	HA04398A	Front Panel Ass'y	1	L05	OE00868A	BT 3x8 @ Binding	3
10	HA04399A	Front Panel Escutcheon Ass'y	1	L06	OE00950A	BT 3x14 @ Pan (Black Chromate)	2
11	BA04892A	Control P.C.B. Ass'y	1	L07	OE00869A	BT 2.6x4 @ Binding	2
12	OJ04707A	Insulator	1	L08	OE00954A	BT 2.6x8 @ Binding	10
13	JA03971A	Chassis Ass'y (Japan)	1	L09	OE00859A	BT 2.6x6 @ Binding	3

5.2. Cassette Lid Ass'y (A01)

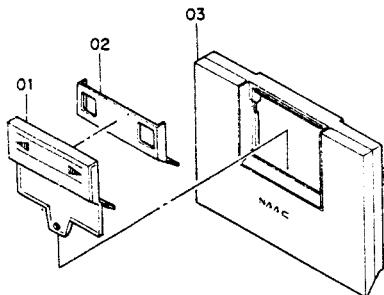


Fig. 5.2

5.3. Chassis Ass'y (A02)

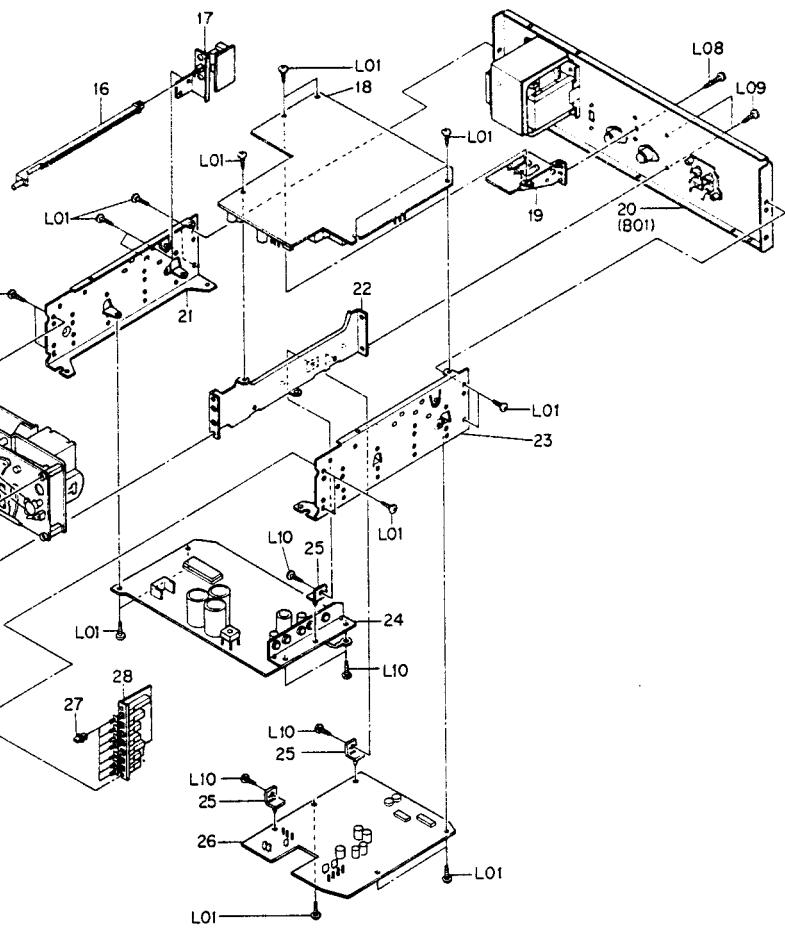


Fig. 5.3

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
A01	HA04401A	Cassette Lid Ass'y Serial No.: A80101001 -	1	18 19 20	BA04870A BA04899A	Main P.C.B. Ass'y Fuse P.C.B. Ass'y (U.S.A., Canada & Others)	1
01	OH04189A	Lid Cover	1		BA04900A	Fuse P.C.B. Ass'y (UK, 220V Class 2 & Australia)	1
02	OH04187A	Indicator Reflector	1		BA04898A	Fuse P.C.B. Ass'y (Japan)	1
03	HA04414A	Cassette Lid Sub Ass'y	1		BA04403A HA04408A	Rear Panel Ass'y (UK) Rear Panel Ass'y (U.S.A. & Canada)	1
A02	JA03969A	Chassis Ass'y (UK)	1	21	HA04404A	Rear Panel Ass'y (Japan)	1
	JA03970A	Chassis Ass'y (U.S.A. & Canada)	1	22	HA04405A	Rear Panel Ass'y (Others)	1
	JA03971A	Chassis Ass'y (Japan)	1	23	HA04406A	Rear Panel Ass'y (Australia)	1
	JA03972A	Chassis Ass'y (Others)	1	24	HA04407A	Rear Panel Ass'y (220V Class 2)	1
	JA03973A	Chassis Ass'y (Australia)	1	25	OJ04650A	Side Chassis L	1
	JA03974A	Chassis Ass'y (220V Class 2) Serial No.: A80101001 -	1	26	OJ04649A	Center Chassis	1
01	OJ04643A	Volume Holder	1	27	OJ04651A	Side Chassis R	1
02	BA04890A	Volume P.C.B. Ass'y	1	28	BA04886A	Logic P.C.B. Ass'y	1
03	OJ04135A	Mechanism Bracket	1	29	OB08771A	Hinge	1
04	OJ04644A	Headphone Jack Holder	1	30	BA04879A	Auto Azimuth P.C.B. Ass'y	1
05	OB08511A	Headphone Jack	1	L01	OH04179A	Function Button A	7
06	BA04897A	Timer Switch P.C.B. Ass'y	1	L02	BA04889A	Switch P.C.B. Ass'y	1
07	OJ04645A	Power Switch Bar Holder	1	L03	BA04891A	Tape Select P.C.B. Ass'y	1
08	OJ04648A	Front Chassis	1	L04	OJ04516A	Headphone Jack Cover	1
09	OH04186A	Indicator Cover	1	L05	OE000857A	BT 3x6 @ Binding (Chromate)	31
10	BA04895A	Direction P.C.B. Ass'y	1	L06	OE000924A	BT 4x16 @ Binding (Chromate)	1
11	OB02228B	Lamp 14V 50mA	1	L07	OE000944A	BT 4x15 @ Binding	3
12	OJ04506C	Lamp Holder	1	L08	OE000078A	BT 4x15 @ Binding (Black Chromate)	4
13	OJ04637A	Cassette Case Plate	1	L09	OE003022A	Washer 4mm Toothed Lock	2
14	BA04896A	Connector P.C.B. Ass'y	1	L06	OE00869A	BT 2x4 @ Binding	2
15	CA08445A	Mechanism Ass'y	1	L07	OE00873A	BT 2x4 @ Binding (Chromate)	1
16	OJ04604B	Power Switch Bar	1	L08	OE00921A	BT 2.6x5 @ Binding (Chromate)	1
17	BA04947A	Power Switch P.C.B. Ass'y (U.S.A. & Canada)	1	L09	OE00860A	BT 3x8 @ Binding (Black Chromate)	1
	BA04948A	Power Switch P.C.B. Ass'y (UK, 220V Class 2, Australia & Others)	1	L10	OE00612A	BT 3x6 @ Binding (Black Chromate)	2
	BA04946A	Power Switch P.C.B. Ass'y (Japan)	1			M3x6 @ Pan	3

5.4. Rear Panel Ass'y (B01)

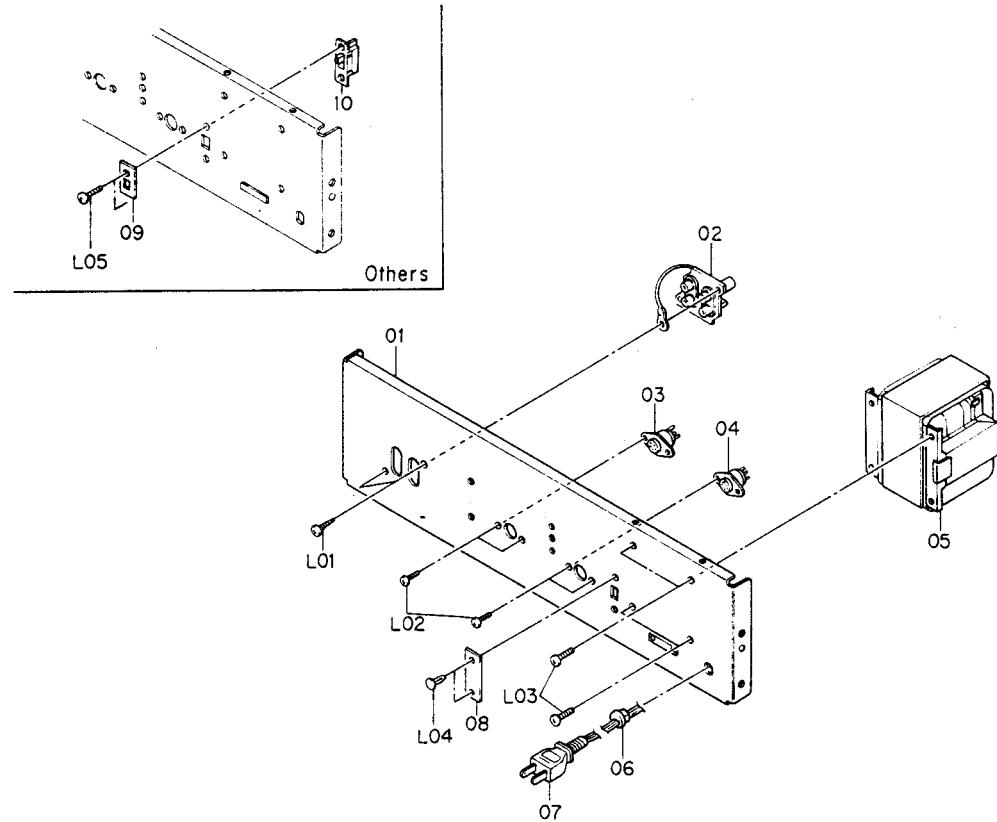


Fig. 5.4

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
B01	HA04408A	Rear Panel Ass'y (U.S.A. & Canada)	1	L03	OE00953A	M4x10 Ø Binding (Black Chromate)	4
	HA04404A	Rear Panel Ass'y (Japan)	1	L04	OB08583A	Plastic Rivet (U.S.A., Canada, Japan, 220V Class 2, UK & Australia)	2
	HA04405A	Rear Panel Ass'y (Others)	1	L05	OE00594A	M3x8 Ø Binding (Bronze) (Others)	2
	HA04403A	Rear Panel Ass'y (UK)	1				
	HA04407A	Rear Panel Ass'y (220V Class 2)	1				
	HA04406A	Rear Panel Ass'y (Australia) Serial No.: A80101001 -	1				
01	OH04205A	Rear Panel	1				
02	BA04945A	Pin Jack P.C.B. Ass'y	1				
03	BA04944A	4P DIN Socket Ass'y	1				
04	BA04949A	8P DIN Socket Ass'y	1				
05	OB06639B	Power Transformer (U.S.A. & Canada)	1				
	OB06640B	Power Transformer (Japan)	1				
	OB06637B	Power Transformer (Others)	1				
	OB06638B	Power Transformer (UK, Australia & 220V Class 2)	1				
06	OB08037U	Cord Bushing C (U.S.A., Canada, Japan, 220V Class 2, Australia & Others)	1				
07	OB08351A	Cord Bushing 4K-4 (UK)	1				
	OB08533A	Power Cord (U.S.A. & Canada)	1				
	OB08219B	Power Cord (Japan)	1				
	OB08348A	Power Cord (UK)	1				
	OB08093U	Power Cord (220V Class 2)	1				
	OB05241A	Power Cord (Australia)	1				
08	OJ04601B	Switch Cover (U.S.A., Canada, Japan, 220V Class 2, UK & Australia)	1				
09	OM03946A	Voltage Selector Lock Plate C (Others)	1				
10	OB07092U	Voltage Selector (Others)	1				
L01	OE00921A	BT 3x8 Ø Binding (Black Chromate)	2				
L02	OE00714A	M2.6x6 Ø Binding (Bronze)	4				

5.5. Mechanism Ass'y (B02)

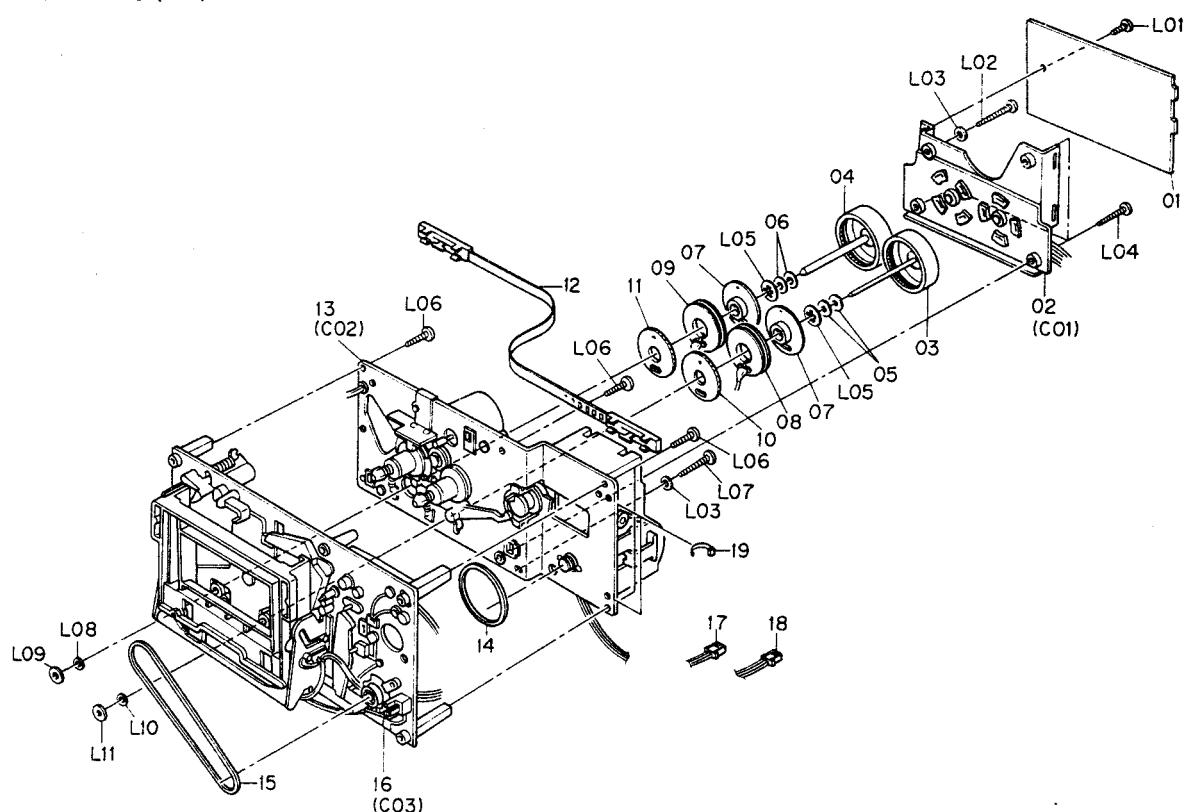


Fig. 5.5

5.6. Flywheel Holder Ass'y (C01)

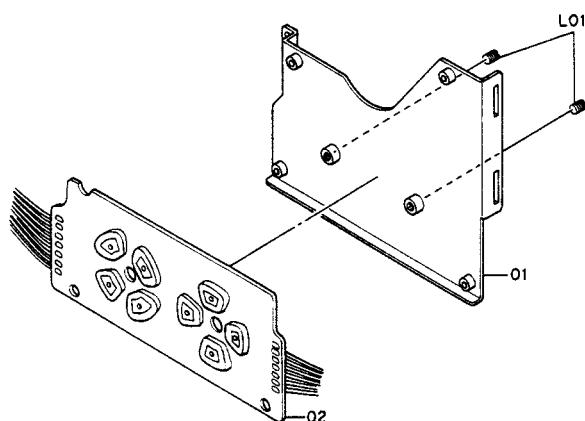


Fig. 5.6

5.7. Sub Mechanism Chassis Ass'y (C02)

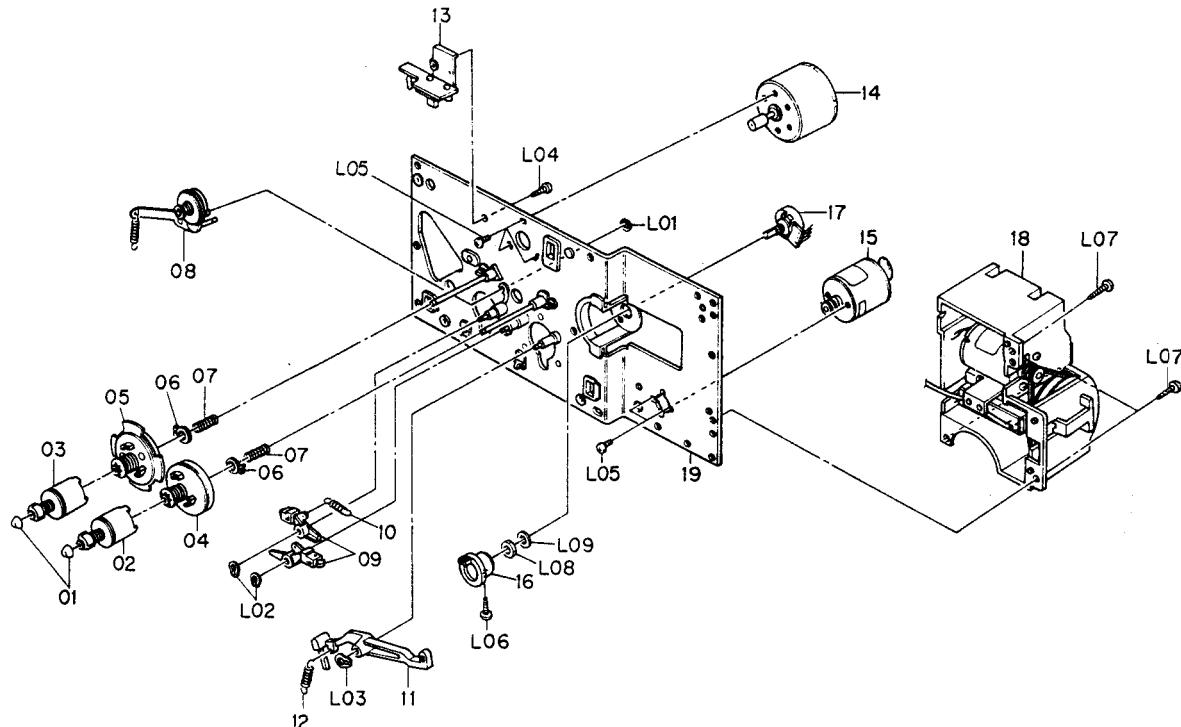


Fig. 5.7

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
B02	CA08445A	Mechanism Ass'y Serial No.: A80101001 -	1	C02	CA08444A	Sub Mechanism Chassis Ass'y Serial No.: A80101001 -	1
01	BA04941A	Motor Control P.C.B. Ass'y	1	01	OC08039B	Reel Hub Head	2
02	CA08422A	Flywheel Holder Ass'y	1	02	CA08038B	Reel Hub B Pulley Ass'y	1
03	CA08433A	Take-up Flywheel Sub Ass'y	1	03	CA08397A	Reel Hub S Pulley Ass'y	1
04	CA08434A	Supply Flywheel Sub Ass'y	1	04	CA08037A	Reel Hub Take-up Ass'y	1
05	OC08020B	Thrust Washer 2.6mm	2	05	CA08452A	Reel Hub Supply Ass'y	1
06	OC08021B	Thrust Washer 3.1mm	2	06	CA08039A	Back Tension Ass'y	2
07	OC08333A	Sensor Plate	2	07	OC08269A	Back Tension Spring C	2
08	CA08391A	Sensor Coil Take-up Sub Ass'y	1	08	CA08193A	Idler Ass'y	1
09	CA08454A	Sensor Coil Supply Sub Ass'y	1	09	CA08042A	Brake Ass'y	2
10	CA08483A	Sensor Gear Take-up Ass'y	1	10	OC08129B	Brake Arm Spring	1
11	CA08485A	Sensor Gear Supply Ass'y	1	11	OC08030C	Brake Drive Arm	1
12	OC08237A	Azimuth Wire	1	12	OC08128A	Brake Drive Arm Spring	1
13	CA08444A	Sub Mechanism Chassis Ass'y	1	13	BA04943A	Counter Pulse Generator P.C.B. Ass'y	1
14	OC08099B	Cam Motor Belt	1	14	CA08242A	Reel Motor Ass'y	1
15	OC08098B	Counter Belt B	1	15	CA08034A	Control Motor Ass'y	1
16	CA08443A	Main Mechanism Chassis Ass'y	1	16	OC08053B	Volume Coupler	1
17	OB02333B	3P-H Connector (Blue with Shield)	1	17	OB07240A	Volume Control 10K (B)	1
18	OB08672A	3P-H Connector	1	18	CA08453A	Playback Head Azimuth Alignment Motor Ass'y	1
19	OB08515A	Insu-Lock	1	19	CA08194A	Sub Chassis Ass'y B	1
L01	OE00857A	BT 3x6 @ Pan	1	L01	OE00698A	E-Ring 2.5mm	1
L02	OE00834A	BT 3x30 @ Pan	1	L02	OE00837A	Stopper Ring 3mm	2
L03	OE00178A	Washer 3.3x8x0.5	2	L03	OE00838A	Stopper Ring 4mm	1
L04	OE00833A	BT 3x20 @ Pan	3	L04	OE00859A	BT 2.6x6 @ Binding	1
L05	OE03023A	Stopper Ring 8mm	2	L05	OE00226A	M2.6x4 @ Pan	5
L06	OE00883A	BT 3x18 @ Pan	5	L06	OE00792A	BT2.6x6 @ Pan	1
L07	OE00835A	BT 3x25 @ Pan	1	L07	OE00846A	BT 3x8 @ Pan	3
L08	OC08347A	Washer 3.1mm FT	1	L08	—	Volume Nut	(1)
L09	OC08345A	Capstan Washer 3mm	1	L09	—	Volume Washer	(1)
L10	OC08348A	Washer 2.6mm FT	1				
L11	OC08346A	Capstan Washer 2.5mm	1				
C01	CA08422A	Flywheel Holder Ass'y Serial No.: A80101001 -	1				
01	CA08382B	Flywheel Holder Sub Ass'y	1				
02	BA04942A	Motor P.C.B. Ass'y	1				
L01	OC08068C	Thrust Screw	2				

5.8. Main Mechanism Chassis Ass'y (C03)

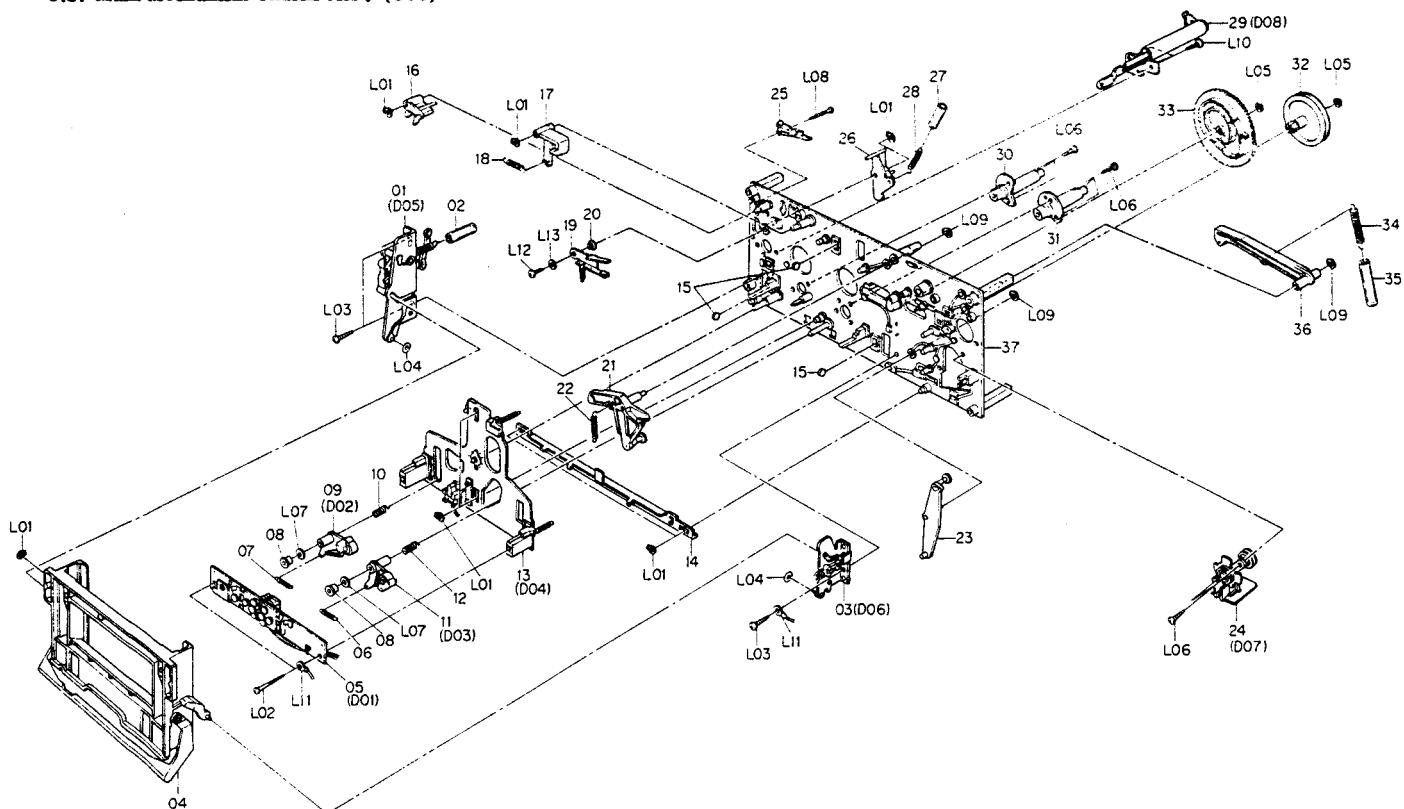


Fig. 5.8

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
C03	CA08443A	Main Mechanism Chassis Ass'y Serial No.: A80101001 -	1	36	CA08028A	Counter-Load Arm	1
01	CA08350A	Cassette Case Holder L Ass'y	1	37	CA08347A	Main Chassis Ass'y	1
02	OC08152A	Lid Arm Spring Tube	1	L01	OE00837A	Stopper Ring 3mm	9
03	CA08455A	Cassette Case Holder R Ass'y	1	L02	OE00834A	BT 3x30 Φ Pan	2
04	CA08451A	Cassette Case Ass'y	1	L03	OE00831A	BT 3x10 Φ Pan	3
05	CA08438A	Head Mount Base Ass'y	1	L04	OE00254A	Washer 3.1mm	2
06	OC08250A	Take-up Roller Arm Spring	1	L05	OE00222A	E-Ring 2mm	2
07	OC08121A	Supply Roller Arm Spring	1	L06	OE00876A	BT 2.6x8 Φ Pan	8
08	OC08313A	Pressure Roller Arm Bushing	1	L07	OE00178A	Washer 3mm	2
09	CA08437A	Supply Pressure Roller Arm Ass'y	1	L08	OE00879A	BT 2x15 Φ Pan	1
10	OC08122C	Supply Pressure Roller Thrust	1	L09	OE00838A	Stopper Ring 4mm	3
		Spring		L10	OE00846A	BT 3x8 Φ Pan	3
11	CA08436A	Take-up Pressure Roller Arm Ass'y	1	L11	OE00895A	Earth Lug 3mm	2
12	OC08183B	Take-up Pressure Roller Thrust	1	L12	OE00859A	BT 2.6x6 Φ Binding	1
		Spring		L13	OC08255A	Washer 2.6mm	1
13	CA08339A	Head Base Ass'y	1				
14	OC08368A	Pressure Roller Drive Bar D	1				
15	OC08086B	Head Base Roller	3				
16	OC08050B	Record Sensor Arm	1				
17	OC08051E	Cassette Hold Arm	1				
18	OC08120A	Cassette Hold Arm Spring	1				
19	OC08371A	Back Tension Arm Ass'y	1				
20	OC08254A	Back Tension Arm Collar	1				
21	OC08027A	Head Base Drive Arm Ass'y	1				
22	OC08143C	Head Base Drive Arm Spring	1				
23	CA08026A	Pressure Roller Drive Arm Ass'y	1				
24	CA08441A	Auto Shut-off Ass'y	1				
25	OC08119A	Record Protector	1				
26	OC08194C	Damper Lock Arm	1				
27	OC08153A	Damper Lock Arm Spring Tube	1				
28	OC08116A	Record Arm Spring	1				
29	CA08030A	Pneumatic Damper Ass'y	1				
30	CA08404B	Supply DD Flange Ass'y	1				
31	CA08457A	Take-up DD Flange Ass'y	1				
32	CA08186A	Cam Drive Gear	1				
33	OC08029H	Control Cam	1				
34	OC08117A	Counter-Load Arm Spring	1				
35	OC08152A	Counter-Load Arm Spring Tube	1				

5.9. Head Mount Base Ass'y (D01)

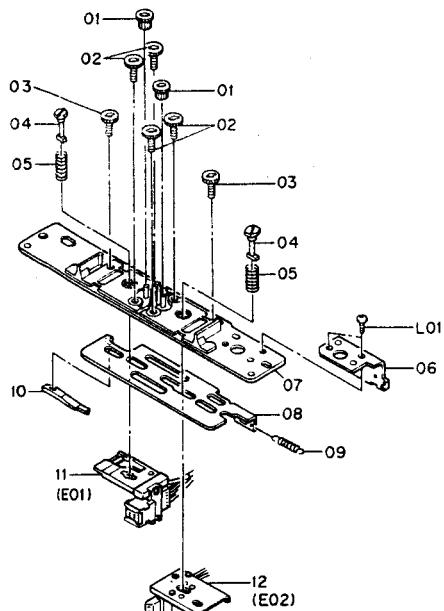


Fig. 5.9

5.11. Take-up Pressure Roller Ass'y (D03)

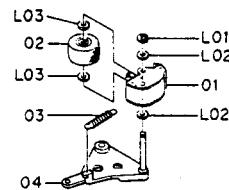


Fig. 5.11

5.13. Cassette Case Holder L Ass'y (D05)

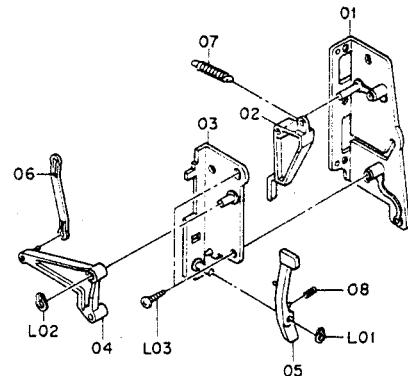


Fig. 5.13

5.10. Supply Pressure Roller Ass'y (D02)

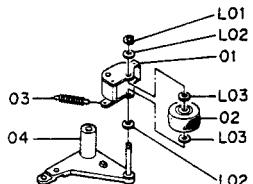


Fig. 5.10

5.12. Head Base Ass'y (D04)

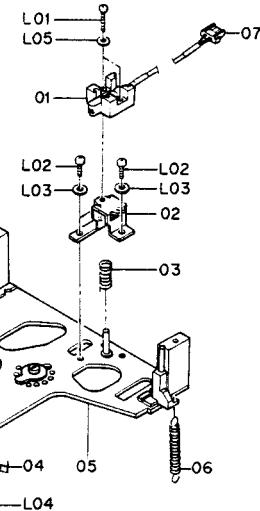


Fig. 5.12

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
D01	CA08438A	Head Mount Base Ass'y Serial No.: A80101001 -	1	L01	OE00042A	E-Ring 1.5mm	1
	OC08028C	Head Height Adjustment Screw	2	L02	OC08024A	Washer 2mm 0.25T	2
	OC08027F	Head Height Adjustment Gear	4	L03	OC08365A	Washer 2mm 0.13T	2
	OC08026D	Azimuth Alignment Screw	2	D04	CA08339A	Head Base Ass'y Serial No.: A80101001 -	1
	OC08161B	Spring Stopper	2	01	GA02103A	EOK Erase Head	1
	OC08187B	Head Plate Spring	2	02	OC08158D	Erase Head Hold Plate	1
	OC08315A	Azimuth Alignment Wire Hold Plate	1	03	OC08166A	Erase Head Hold Plate Spring	1
	CA08083D	Head Mount Base Sub Ass'y	1	04	OC08174D	Cassette Hold Spring	1
	OC08352A	AP Drive Plate	1	05	CA08003R	Head Base Ass'y	1
	OC08362A	TG Spring	1	06	OC08175A	Head Base L Spring	3
	OC08351A	PH Azimuth Plate	1	07	OB08944A	2P-H Connector	1
	CA08439A	PA-1L Playback Head Ass'y	1	L01	OE00951A	M1.7x7 \oplus Pan (Black Chromate)	2
	CA08440A	R-8L Record Head Ass'y	1	L02	OE00909A	M2x6 \oplus Pan	3
L01	OE00917A	BT 2.6x5 \oplus Pan	2	L03	OE00117A	Washer 2mm	3
				L04	OE00853A	BT 2x3 \oplus Pan	1
				L05	OE00952A	Washer 1.7mm	2
D02	CA08437A	Supply Pressure Roller Arm Ass'y Serial No.: A80101001 -	1	D05	CA08350A	Cassette Case Holder L Ass'y Serial No.: A80101001 -	1
	CA08403A	Supply Tape Guide	1	01	CA08326B	Cassette Case Holder L Sub Ass'y	1
	OC08357A	Pressure Roller	1	02	OC08073C	Lid Arm A	1
	OC08495A	Supply Guide Spring	1	03	OC08306A	Eject Arm Holder	1
	CA08401A	Supply Roller Arm Ass'y	1	04	OC08307A	Eject Arm A	1
	OE00042A	E-Ring 1.5mm	1	05	OC08197C	Eject Arm B	1
	OC08024A	Washer 2mm 0.25T	2	06	OC08199B	Eject Arm Joint	1
D03	OC08365A	Washer 2mm 0.13T	2	07	OC08114A	Lid Arm Spring	1
	CA08436A	Take-up Pressure Roller Arm Ass'y Serial No.: A80101001 -	1	08	OC08211C	Eject Arm Spring	1
	CA08402A	Take-up Tape Guide	1	L01	OE00837A	Stopper Ring 3mm	1
	OC08357A	Pressure Roller	1	L02	OE00838A	Stopper Ring 4mm	1
	OC08362A	Take-up Guide Spring	1	L03	OE00865A	BT 3x10 \oplus Binding	2
D04	CA08400A	Take-up Roller Arm Sub Ass'y	1				

5.14. Cassette Case Holder R Ass'y (D06)

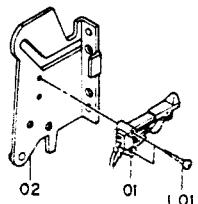


Fig. 5.14

5.15. Auto Shut-off Ass'y (D07)

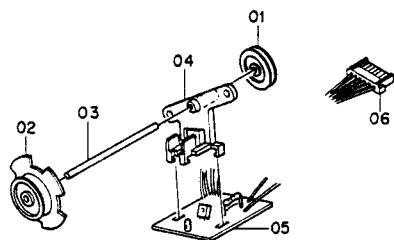


Fig. 5.15

5.16. Pneumatic Damper Ass'y (D08)

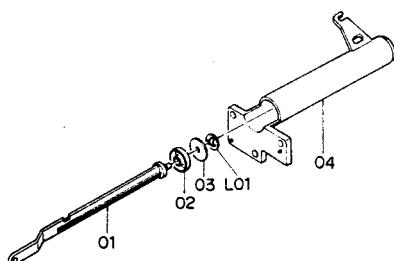


Fig. 5.16

5.17. PA-1L Playback Head Ass'y (E01)

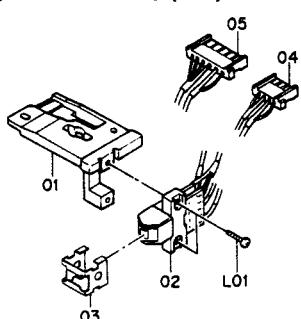


Fig. 5.17

5.18. R-8L Record Head Ass'y (E02)

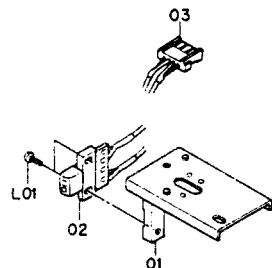


Fig. 5.18

Schematic Ref. No.	Part No.	Description	Q'ty
D06	CA08455A	Cassette Case Holder R Ass'y Serial No.: A80101001 -	1
01	OC08133A	Eject Sensor	1
02	CA08427A	Cassette Case Holder R Sub Ass'y	1
L01	OE00840A	BT 2x8 ⊕ Pan	1
D07	CA08441A	Auto Shut-off Ass'y Serial No.: A80101001 -	1
01	OC08047A	Shut-off Pulley A	1
02	OC08309B	Shut-off Pulley B	1
03	OC08088B	Shut-off Pulley Shaft	1
04	OC08207B	Shut-off Pulley Holder	1
05	BA04852A	Shut-off P.C.B. Ass'y	1
06	OB02339B	6P-H Connector	1
D08	CA08030A	Pneumatic Damper Ass'y Serial No.: A80101001 -	1
01	OC08058C	Damper Piston	1
02	OC08102C	Damper Ring	1
03	OC08010C	Damper Plate	1
04	OC08059D	Sylinder	1
L01	OE00874A	Stopper Ring CS 2mm	1
E01	CA08439A	PA-1L Playback Head Ass'y Serial No.: A80101001 -	1
01	OC08350B	Playback Head Plate	1
02	GA02162A	PA-1L Playback Head	1
03	OC08349C	Tape Protector	1
04	OB02341B	4P-H Connector	1
05	OB02342B	6P-H Connector	1
L01	OE00886A	M1.7x6.5 ⊕ Pan	1
E02	CA08440A	R-8L Record Head Ass'y Serial No.: A80101001 -	1
01	CA08308A	Record Head	1
02	GA01050A	R-8L Record Head	1
03	OB02340B	4P-H Connector	1
L01	OE00887A	M1.7x4 ⊕ Pan	2

Notes: 1. Mounting diagram shows a dip side view of the printed circuit board.

2. Diode is 1SS53, 1S1555, or 1SS176 unless otherwise specified.

3. Following transistors are interchangeable with each other.

a. 2SA733, 2SA608SP, 2SA1048, 2SA1175

b. 2SC945, 2SC536SP, 2SC2458, 2SC2785

4. Abbreviation for part name:

TR — Transistor, SiD — Silicon Diode, GD — Germanium Diode, ZD — Zener Diode

RK — Carbon Resistor, RM — Metal Film Resistor, RF — Fail Safe Type Resistor, RC — Cement Resistor, RW — Wire Wound Resistor

CE — Electrolytic Capacitor, CM — Mylar Capacitor, CC — Ceramic Capacitor, CP — PP Capacitor,

CT — Tantalum Capacitor, CF — Film Capacitor, C — Mica Capacitor

6.1. Power Switch P.C.B. Ass'y

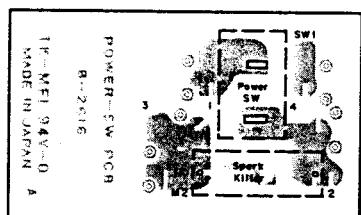


Fig. 6.1

6.2. Fuse P.C.B. Ass'y

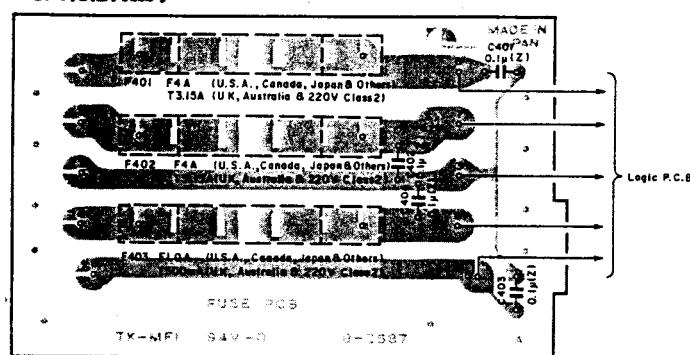


Fig. 6.2

6.3. Shut-off P.C.B. Ass'y

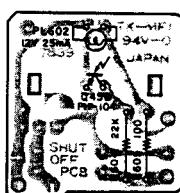


Fig. 6.3

6.4. Counter Pulse Generator P.C.B. Ass'y

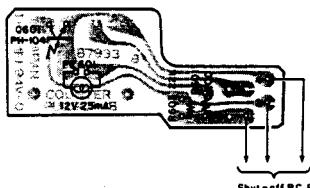


Fig. 6.4

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA04947A	Power Switch P.C.B. Ass'y (U.S.A. & Canada)		BA04899A	Fuse P.C.B. Ass'y (U.S.A., Canada & Others)		0M04432A	Fuse Label 4A 125V x 2 (U.S.A., Canada & Others)
	BA04946A	Power Switch P.C.B. Ass'y (Japan)		BA04898A	Fuse P.C.B. Ass'y (Japan)		0M04441A	Fuse Label 4A 250V x 2 (Japan) (1)
	BA04948A	Power Switch P.C.B. Ass'y (UK, Australia, 220V Class 2 & Others)		BA04900A	Fuse P.C.B. Ass'y (UK, Australia & 220V Class 2)		0M03936B	Fuse Label T3.15A 250V (UK, Australia & 220V Class 2) (1)
SW1	OB02616A	Power Switch P.C.B.	C401,402	OB02587A	Fuse P.C.B. CC 0.1μ 50V Z		0B08349A	Fuse Clip (UK, Australia & 220V Class 2) (6)
SW1	OB07407A	Power Switch (U.S.A. & Canada)	403,404	OBT9292A	Fuse F4A 125V (U.S.A., Canada & Others)		BA04852A	Shut-off P.C.B. Ass'y
SW1	OB07406A	Power Switch (Japan)	F401,402	OB90002A	Fuse F4A 250V (Japan)		OB07839B	Shut-off P.C.B.
SW1	OB07408A	Power Switch (UK, Australia, 220V Class 2 & Others)		OB90001A	Fuse F4A 250V (Japan)		OB06228A	Photo TR PH104
M2	OB08342A	Spark Killer (U.S.A. & Canada)	F401,402	OB08281A	Fuse T3.15A 250V (UK, Australia & 220V Class 2)	Q450	OB05615A	RK 22K 1/4W J
M2	OB08363A	Spark Killer (Japan)	F403	OB08374A	Fuse F1A 250V (U.S.A., Canada & Others)	R604	OB09215A	RF 100 1/4W J
M2	OB08955A	Spark Killer (UK, Australia, 220V Class 2 & Others)	F403	OB08686A	Fuse F1A 250V (Japan)	R605	OB08552A	Lamp 12V 25mA
	OE00622A	M3x5 Ⓛ Pan (2A) (2)	F403	OB08457A	Fuse T500mA 250V (UK, Australia & 220V Class 2)	PL602	BA04943A	Counter Pulse Generator P.C.B. Ass'y
	OE00752A	Eyelet 2x3 (2)		OM04190A	Fuse Label 1A 250V (U.S.A., Canada & Japan) (1)		OB07933B	Counter Pulse Generator P.C.B.
	OJ04646A	Power Switch Holder (1)		OM04096C	Fuse Label T500mA (UK, Australia & 220V Class 2) (1)	Q601	OB06228A	Photo TR PH104
						R601	OB09215A	RK 100 1/4W J
						R603	OB05661A	RK 22K 1/4W JV
						PL601	OB08552A	Lamp 12V 25mA
							OC08281B	P.C.B. Holder (1)
							OE00792A	BT 2.6x6 Ⓛ Pin (Chromate) (2)

6.5. Direction P.C.B. Ass'y

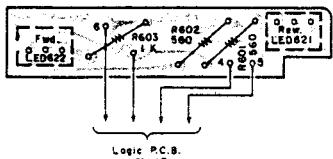


Fig. 6.5

6.6. Timer Switch P.C.B. Ass'y

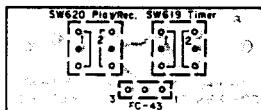


Fig. 6.6

6.7. Tape Select P.C.B. Ass'y

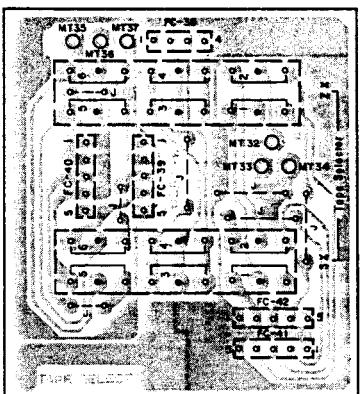


Fig. 6.7

6.8. Volume P.C.B. Ass'y

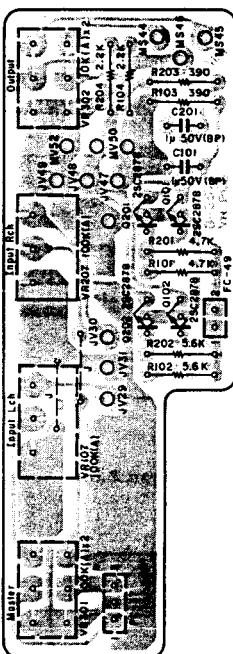


Fig. 6.8

6.9. Counter P.C.B. Ass'y

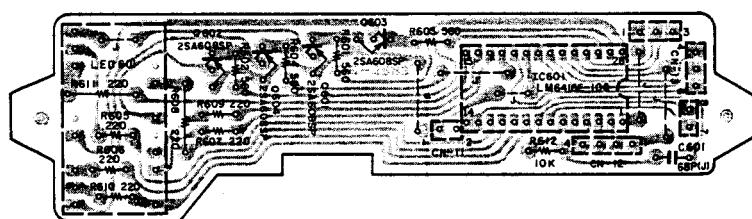


Fig. 6.9

Schematic Ref. No.	Part No.	Description
	BA04895A	Direction P.C.B. Ass'y
LED621 622	OB02584A OB06448A	Direction P.C.B. LED (RED + GRN)
R601,602 R603	OB05575A OB01857A	RK 560 1/4W J RK 1K 1/4W J
	BA04897A	Timer Switch P.C.B. Ass'y
SW619,620	OB02586B OB07464A	Timer Switch P.C.B. Push Switch
	BA04891A	Tape Select P.C.B. Ass'y
SW618	OB02580B OB07461A	Tape Select P.C.B. Push Switch
	BA04890A	Volume P.C.B. Ass'y
Q101,102 201,202	OB02579B OBT6299A	Volume P.C.B. TR 2SC2878
VR107,207	OBT7202A	VR 100K (A)
VR301	OB07203A	VR 100K (A)x2
VR302	OB07204A	VR 10K (A)x2
R101,201	OBT1846A	RK 4.7K 1/4W J
R102,202	OBT1887A	RK 5.6K 1/4W J
R103,203	OBT5691A	RK 390 1/4W J
R104,204	OBT5622A	RK 2.2K 1/4W J
C101,201	OBT9187A	CE 1μ 50V (BP)
FC37	OB82037A OM04252A	3P Flat Cable Label CN-37 (1)
	BA04894A	Counter P.C.B. Ass'y
IC601	OB02583A	Counter P.C.B.
Q601,602 603,604	OB06368A	IC LM6416E-106
LED601	OB06319A	TR 2SA608SP
R601,602 603,604	OBT6442A	Counter LED
R605,606 607,609	OBT9661A	RK 560 1/6W J
610	OBT9661A	RK 220 1/6W J
R608,611	OBT1933A	RK 220 1/4W J
R612	OBT9701A	RK 10K 1/6W J
C601	OBT9393A	CC 68P 50V J
CN11	OB02344A	2P-H Connector
CN12	OB02345B	4P-H Connector
CN13	OB02346A	8P-H Connector
	BA04893A	Indicator P.C.B. Ass'y
IC301,302	OB02582B	Indicator P.C.B.
Q101,201	OB06369A	IC TA7612AP
LED303	OB06401A	TR 2SC536SP
D101,201	OBT6398A	Indicator LED
D102,202	OBT6109A	SID 1SS176
R101,201	OBT9725A	SID GP08B
R102,202	OBT9709A	RK 100K 1/6W J
R103,104	OBT9719A	RK 22K 1/6W J
203,204	OBT9681A	RK 56K 1/6W J
R301-320	OBT9701A	RK 1.5K 1/6W J
R321,326	OBT9658A	RK 10K 1/6W J
R322	OBT9658A	RK 5.6K 1/6W J
R323	OBT1857A	RK 1K 1/4W J
R324	OBT9655A	RK 120 1/6W J
R325	OBT9677A	RK 1K 1/6W J
C301	OBT9282A	CC 100P 50V K
FC34	OB05360B	4P Flat Cable
FC35	OB05362B	3P Flat Cable
FC44,45	OB05374C	11P Flat Cable
	OM04250A OM04251A OE00130A	Label CN-34 (1) Label CN-35 (1) Earth Lug 2.6mm (1)

6.10. Indicator P.C.B. Ass'y

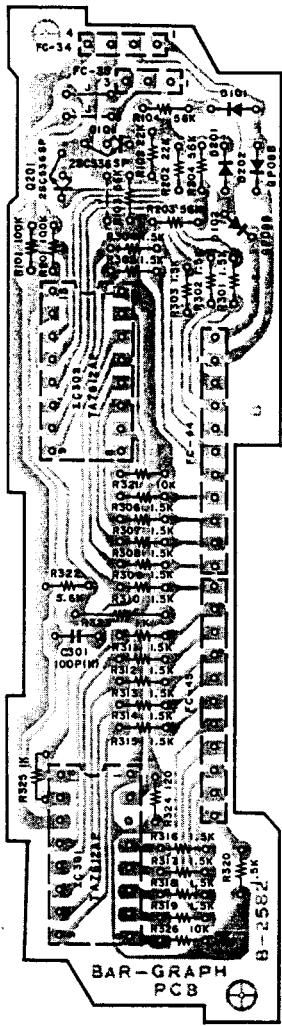


Fig. 6.10

6.11. Switch P.C.B. Ass'y

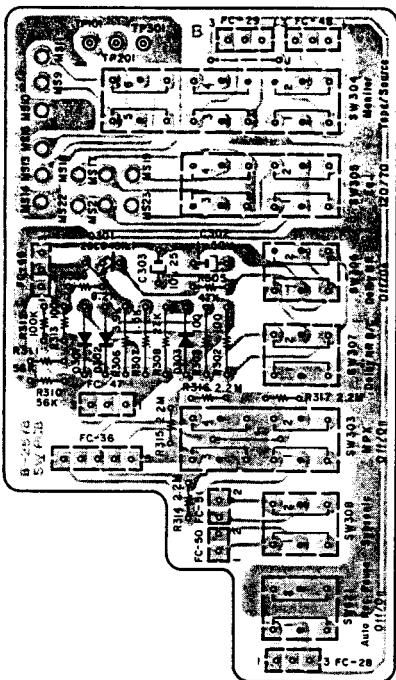


Fig. 6.11

Schematic Ref. No.	Part No.	Description
	BA04889A	Switch P.C.B. Ass'y
Q301	OBT02578B	Switch P.C.B.
D301,302	OBT1872A	TR 2SC945L (P,Q)
303	OBT6181A	SiD 1SS53
R302,303	OBT9653A	RK 100 1/6W J
R305	OBT9717A	RK 47K 1/6W J
R306	OBT5675A	RK 3.9K 1/4W J
R307	OBT5506A	RK 1.5K 1/4W J
R308	OBT5743A	RK 27K 1/4W J
R309	OBT9699A	RK 8.2K 1/6W J
R310,311	OBT9719A	RK 56K 1/6W J
R312,313	OBT9725A	RK 100K 1/6W J
R314,315	OBT5671A	RK 2.2M 1/4W J
316,317		
C302	OBT1405A	CE 1μ 50V
C303	OBT1674A	CE 10μ 25V
FC28	OB82035A	3P Flat Cable
FC29	OB82034A	3P Flat Cable
FC36	OB82036A	5P Flat Cable
FC50	OB05331B	2P Flat Cable
FC51	OB82001B	2P Flat Cable
	OB07460A	Push Switch (1)
	OM04240A	Label CN-28 (1)
	OM04438A	Label CN-29 (1)
	OM04440A	Label CN-36 (1)

6.12. Control P.C.B. Ass'y

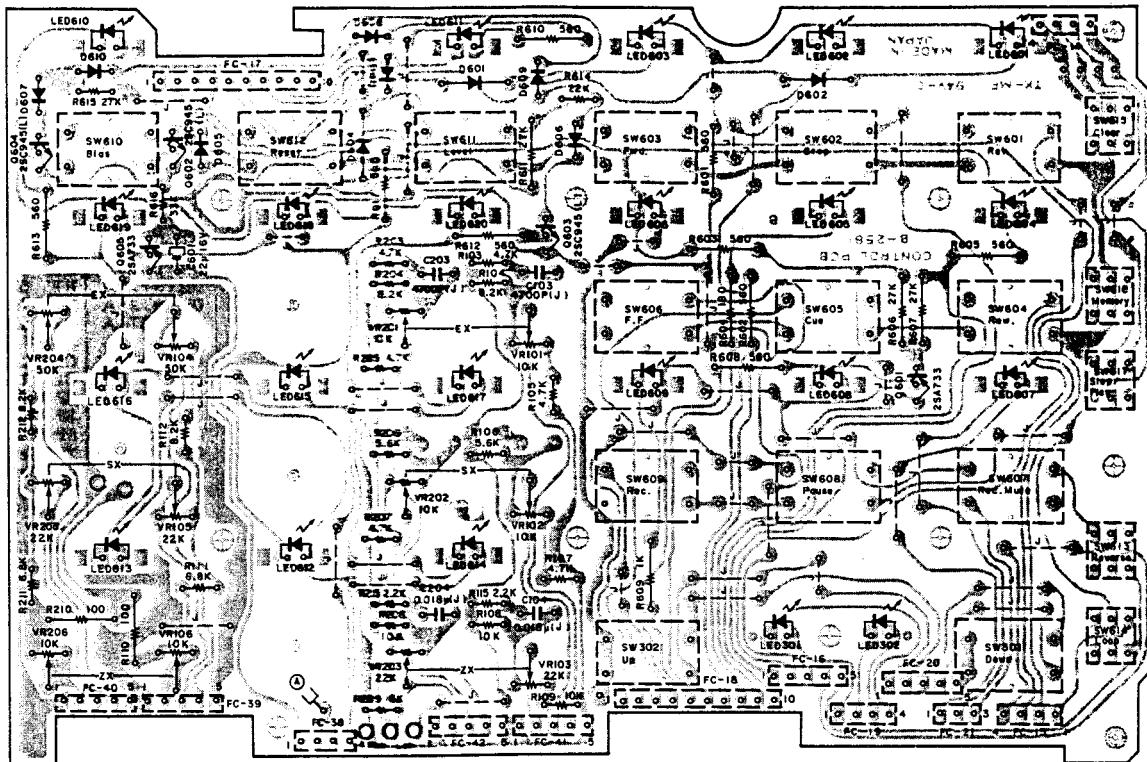


Fig. 6.12

6.13. Motor Control P.C.B. Ass'y

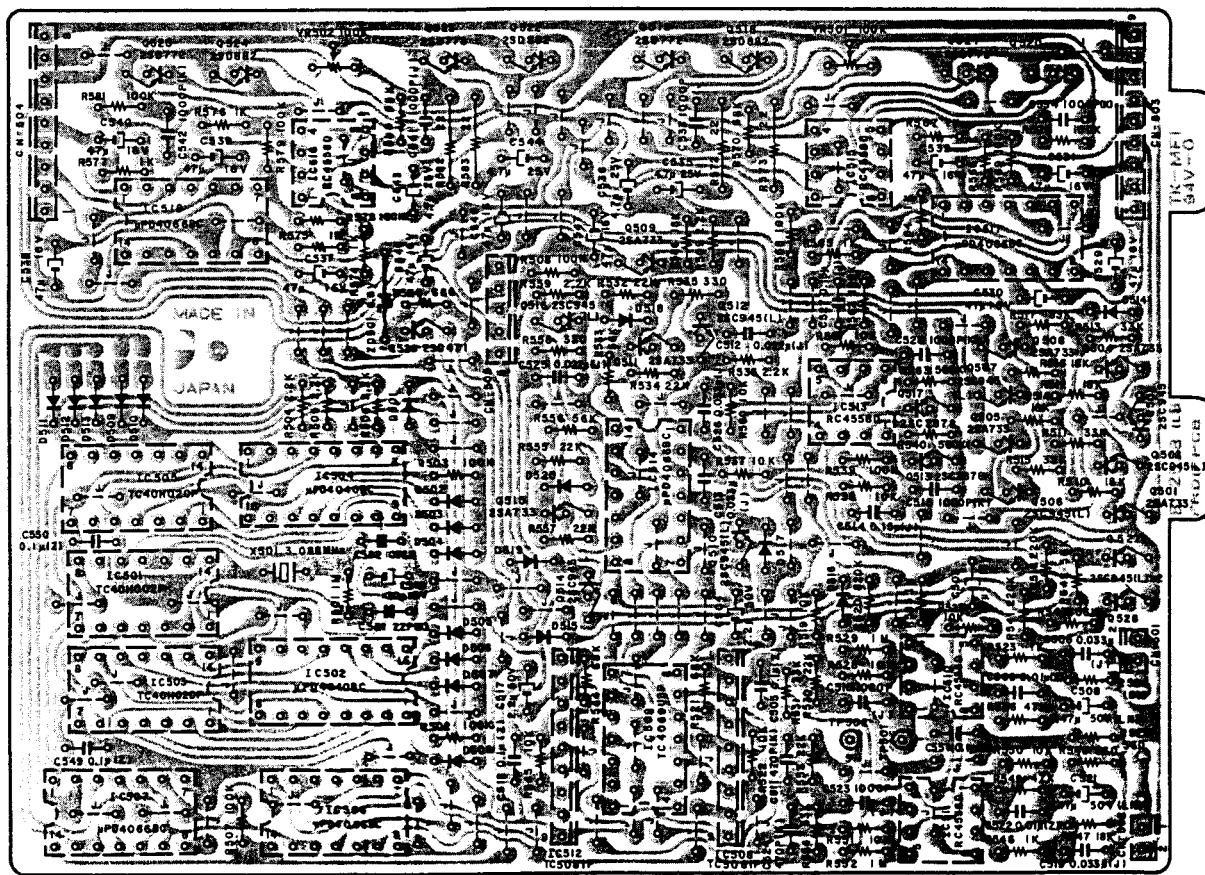


Fig. 6.13

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA04892A	Control P.C.B. Ass'y		BA04941A	Motor Control P.C.B. Ass'y	C508,521	OBT9222A	CE 0.47μ 50V (LN)
	OB02581B	Control P.C.B.		OB02588B	Motor Control P.C.B.	C509,522	OBT9290A	CC 0.01μ 50V Z
Q601,605	OBT6013A	TR 2SA733 (P,Q)		OB06423A	IC TC40H002P	C510,523	OBT9844A	CF 1000P 50V J
Q602,603	OBT1872A	TR 2SC945L (P,Q)	IC501	OB06422A	IC μPD4040BC	C511,524	OBT9286A	CC 470P 50V K
604			IC502,504	OB06424A	IC TC40H020P	C512,525	OBT9848A	CF 0.022μ 50V J
D601,602	OBT6181A	SID ISS53	IC503,505	OB06144A	IC μPD4066BC	C514,527	OBT5914A	CM 0.15μ 50V J
604			IC506,507			C515,528	OBT9288A	CC 1000P 50V K
D603,605	OBT6398A	SID ISS176	514,517			C529,530	OBT1403A	CE 47μ 16V
606,607			518			531,532		
608,609			513,515			537,538		
610			516			539,540		
LED301	OB06445A	LED ORN TLO-123 (15)	IC508,512	OB06297A	IC TC5081P	545,546		
302,607			IC509	OB06270A	IC TC4069UBP	547		
609,620			IC510,511	OB06124B	IC RC4558D			
LED601	OB06446A	LED GRN TLPG-163	516					
602,603			Q501,504	OBT6013A	TR 2SA733 (P,Q)	C535,536	OBT1402A	CE 4.7μ 25V
604,605			505,508			543,544		
606,608			509,511			C548	OBT5885A	CE 100μ 10V
VR101,102	OB07404A	Semi-fixed VR 10K	515			CN501	OB02280A	2P-T Post
106,201			Q502,503	OBT1872A	TR 2SC945L (P,Q)	CN502	OB08656A	2P-T Post
202,206			506,507			CN503,504	OB08645A	9P-T Post
VR103,105	OB07277A	Semi-fixed VR 22K	510,512			CN505	OB08724A	5P-T Post
203,206			514,516				OE00507A	Nut Hex. M3 (8)
VR104,204	OB07260A	Semi-fixed VR 50K	527,528				OE00521A	(Chromate)
R103,105	OBT9693A	RK 4.7K 1/6W J	Q513,517	OBT6299A	TR 2SC2878		OJ04485A	M3x8 @Pan (8)
107,203			Q518,520	OB06316A	TR 2SD882 (P,Q)			(Chromate)
205,207			522,524					Heat Sink B (4)
R104,112	OBT9699A	RK 8.2K 1/6W J	Q519,521	OB06303A	TR 2SB772 (P,Q)			
204,212			523,525					
R106,206	OBT9695A	RK 5.6K 1/6W J	Q526	OB06066A	TR 2SD471 (L,M)			
R108,109	OBT9701A	RK 10K 1/6W J	ZD501	OBT6426A	ZD 8.6V XZ086			
208,209			D501-520	OBT6398A	Sid ISS176			
R110,210	OBT1679A	RK 100 1/4W J	X501	OB02324A	Xtal 3.088MHz			
R111,211	OBT9697A	RK 6.8K 1/6W J	VR501,502	OB09060A	Semi-fixed VR 100K			
R115,215	OBT9685A	RK 2.2K 1/6W J	R501,529	OBT9749A	RK 1M 1/6W J			
R601,602	OBT5575A	RK 560 1/4W J	552,585					
603,605			R502,503	OBT9725A	RK 100K 1/6W J			
608,610			507,508					
612,613			539,562					
617			568,569					
R604	OBT5578A	RK 180 1/4W J	571,578					
R606,607	OBT5743A	RK 27K 1/4W J	579,581					
611			R504,505	OBT9685A	RK 2.2K 1/6W J			
R609	OBT1857A	RK 1K 1/4W J	506,509					
R614	OBT9709A	RK 22K 1/6W J	536,559					
R615	OBT9711A	RK 27K 1/6W J	R510,512	OBT9707A	RK 18K 1/6W J			
R616	OBT9713A	RK 33K 1/6W J	514,516					
C103,203	OBT9852A	CF 4700P 50V J	524,547					
C104,204	OBT9854A	CF 6800P 50V J	586					
C601	OBT1862A	CE 22μ 16V	R511,513	OBT9713A	RK 33K 1/6W J			
SW301,302	OBT07396A	Double Action Switch	515,517					
		Push Switch	531,554					
SW601-612	OB07459A	Push Switch	R518,541	OBT9733A	RK 220K 1/6W J			
SW613,614	OB07462A	Push Switch	R519,522	OBT9701A	RK 10K 1/6W J			
616,617			527,528					
SW615	OB07463A	Push Switch	537,538					
FC14,15	OB05361B	4P Flat Cable	545,550					
FC16	OB05371B	5P Flat Cable	551,560					
FC17	OB05372B	10P Flat Cable	561					
FC18	OB82038A	10P Flat Cable	R520	OBT9747A	RK 820K 1/6W J			
FC19	OB05360B	4P Flat Cable	R521,544	OBT9721A	RK 68K 1/6W J			
FC20	OB05370B	5P Flat Cable	570,580					
FC21	OB05346B	3P Flat Cable	R523,546	OBT9677A	RK 1K 1/6W J			
FC38	OB05354B	4P Flat Cable	564,565					
FC39,40	OB05365B	5P Flat Cable	566,567					
FC41,42	OB05368B	5P Flat Cable	574,575					
	OE00857A	BT 3x6 Ⓛ Binding (Chromate) (1)	576,577					
		Lens House (20)	R525,548	OBT9671A	RK 560 1/6W J			
	OJ04653A	Fader House (1)	R526,549	OBT9717A	RK 47K 1/6W J			
	OJ04654A	Label CN-14 (1)	R530,532	OBT9709A	RK 22K 1/6W J			
	OM04231A	Label CN-15 (1)	534,553					
	OM04222A	Label CN-16 (1)	555,557					
	OM04223A	Label CN-17 (1)	R533,542	OBT9719A	RK 56K 1/6W J			
	OM04224A	Label CN-18 (1)	R535,558	OBT9665A	RK 330 1/6W J			
	OM04330A	Label CN-19 (1)	R540,563	OBT9743A	RK 560K 1/6W J			
	OM04225A	Label CN-20 (1)	R572,573	OB09049A	RF 22 1/4W J			
	OM04226A	Label CN-21 (1)	582,583					
			R584	OBT9673A	RK 680 1/6W J			
			C501	OBT9279A	CC 22P 50V K			
			C502	OBT9277A	CC 10P 50V J			
			C503	OBT1392A	CE 470μ 16V			
			C504,517	OBT9372A	CE 2.2μ 50V			
			C505,518	OBT9292A	CC 0.1μ 50V Z			
			551					
			C506,513	OBT5583A	CM 0.033μ 50V J			
			519,526					

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA04886A	Logic P.C.B. Ass'y	D602-611 614-619 623,624 626-633	OBT6398A	SiD 1SS176 (27)	R706 R712,713 R717 R731	OBT9711A OBT5509A OBT1683A OB09217A C601,602 C603,604	RK 27K 1/6W J RK 33K 1/4W J RK 15K 1/4W J RF 5.6 1/4W J CC 220P 50V K CE 1μ 50V
	— DC Supply —		640	OB08908A	Xtal KBR400BT	C606,615	OBT1405A	CE 4.7μ 25V
IC401	OB06124B	IC JRC4558D	X601	OB02307A	Xtal KBR800H	630	OBT1402A	CF 4700P 50V J
Q403,404	OBT1872A	TR 2SC945L (P,Q)	X602	OB07258A	Semi-fixed VR 220K	C608,609	OBT9852A	CC 100P 50V K
409,414			VR601	OB07257A	Semi-fixed VR 100K	C612,613	OBT9282A	CE 10μ 16V
415			VR602	OB07329A	Semi-fixed VR 2K	C614	OBT1412A	CC 5P 50V J
Q407,408	OBT6013A	TR 2SA733 (P,Q)	VR603	OB07256A	Semi-fixed VR 10K	C616	OBT9276A	CE 330μ 16V
411			VR604	OBT9725A	RK 100K 1/6W J	C617	OBT9327A	CE 0.33μ 50V (LN)
Q410,412	OBT6322A	TR 2SC2002 (K,L)	R601,607			C619	OBT9865A	CF 0.056μ 50V J
Q416	OBT1426A	TR 2SA562 (O,Y)				C620	OBT9370A	CC 33P 50V J
ZD401	OBT6058A	ZD 5.1V YZ051				CN7	OBT2347A	3P-T Post BLU
ZD402	OBT6384A	ZD 5.5V XZ055				CN8	OB08653A	3P-T Post
D401	OBT6283A	Diode Bridge DBA30				CN9	OB02286A	6P-T Post BLU
D402,403	OB06109A	SiD GP08B				CN10	OB08642A	6P-T Post
D404	OBT6282A	Diode Bridge DBA10				CN11	OB08656A	2P-T Post
D405,406	OBT6398A	SiD 1SS176				CN12	OB08654A	4P-T Post
D407	OBT6181A	SiD 1SS53				CN13	OB08644A	8P-T Post
R401,426	OBT1857A	RK 1K 1/4W J					OB08964A	TR Mica TO-126(2)
R402	OBT1679A	RK 100 1/4W J	703,704				OE00507A	Nut Hex. M3 (2)
R403	OBT1846A	RK 4.7K 1/4W J	709,710				OE00510A	(Chromate) M3x8 ⊕ Pan (2A)
R404	OBT1888A	RK 10K 1/4W J	720,721				OJ04485A	Heat Sink B (1)
R405,415	OBT5671A	RK 2.2M 1/4W J	722,726				— Miscellaneous —	
R406	OBT9528A	RM 13.7K 1/4W F	727,734				OB02577B	Logic P.C.B.
R407	OBT9203A	RM 10K 1/4W F	730,735				OB06255A	TR 2SD880 (Y)
R408	OBT1887A	RK 5.6K 1/4W J	736				OB06256A	TR 2SB834 (Y,GR)
R409	OBT5794A	RM 11K 1/4W F	738				OB08601A	TR Mica TO-220(5)
R410,417	OBT9504A	RM 1K 1/6W J	739,740				OB08602A	TR Bushing TO-220
R411	OBT9677A	RK 1K 1/6W J	741,742				QE00507A	Nut Hex. M3 (5)
R412	OBT9653A	RK 100 1/6W J	743,744				QE00608A	M3x10 ⊕ Fan (3A) (Chromate) (5)
R413,431	OBT9693A	RK 4.7K 1/6W J	745,746				OJ04647B	Heat Sink (1)
R414	OBT9701A	RK 10K 1/6W J	747,748				OB02349A	4P-JP Connector
R416,420	OBT9695A	RK 5.6K 1/6W J	749,750				OB02350A	5P-JP Connector
421			751,752				OB02355A	10P-JP Connector
R418,425	OBT9725A	RK 100K 1/6W J	753,754				OB02348A	3P-JP Connector
427			755,756				CN14,15	
R419	OBT9707A	RK 18K 1/6W J	757,758				34	
R422	OBT9667A	RK 390 1/6W J	759,760				CN16	
R423,434	OBT9737A	RK 330K 1/6W J	761,762				CN17,18	
R424	OBT9729A	RK 150K 1/6W J	763,764				CN26,27	
R428	OBT9713A	RK 33K 1/6W J	765,766				28,29	
R429	OBT9719A	RK 56K 1/6W J	767,768				FC22	
R430	OBT5622A	RK 2.2K 1/4W J	769,770				FC23	
R432,433	OB09243A	RF 4.7 1/2W J	771,772				OB05337B	2P Flat Cable
C401	OB40037A	CE 10000μ 25V	773,774				OB05331B	2P Flat Cable
C402	OB09374A	CE 6800μ 25V	775,776				OB05345B	3P Flat Cable
C403,407	OBT1272A	CE 100μ 25V	777,778				OB05345B	3P Flat Cable
C404,408	OBT9276A	CC 5P 50V J	779,780				OB05352B	3P Flat Cable
C405	OB09798A	CE 6800μ 16V	781,782				OB02343B	5P-H Connector (1)
C406	OB09799A	CE 4700μ 25V	783,784				OB08515A	Insu-Lock (8)
C409,411	OBO1397A	CE 1000μ 16V	785,786				OB90005A	Insu-Lock (1)
C410	OBT9218A	CE 47μ 16V (LN)	787,788				OE00037A	Earth Lug B-5 (1)
C412	OB01406A	CE 2200μ 16V	789,790				OE00037A	BT 3x6 ⊕ Binding (Chromate) (3)
C413	OBT1405A	CE 1μ 50V	791,792				OM04331A	Label CN-22 (1)
C414	OBT9873A	CF 0.27μ 50V J	793,794				OM04332A	Label CN-23 (1)
	— Logic —		795,796				OM04236A	Label CN-24 (1)
			797,798				OM04237A	Label CN-25 (1)
IC601	OB06324A	IC LM6402A-052	799,800					
IC602	OB06392A	IC LM6416E-149	801,802					
IC603	OB06124B	IC JRC4558D	803,804					
IC604	OB06317A	IC μPD4030BC	805,806					
IC605	OB06214A	IC μPD4071BC	807,808					
Q601,606	OBT6013A	TR 2SA733 (P,Q)	809,810					
607,611			811,812					
612,613			813,814					
614,621			815,816					
626,627			817,818					
629,630			819,820					
631,633			821,822					
635			823,824					
Q602,603	OBT1872A	TR 2SC945L (P,Q)	825,826					
604,605			827,828					
608,617			829,830					
618,619			831,832					
622,623			833,834					
628,632			835,836					
634,636			837,838					
Q609	OB06316A	TR 2SD882 (P,Q)	839,840					
Q610	OB06303A	TR 2SB772 (P,Q)	841,842					
Q615	OB06066A	TR 2SD471 (L,M)	843,844					
Q616	OB06069A	TR 2SB564 (L,M)	845,846					
Q624,625	OBT6372A	TR 2SA953 (K,L)	847,848					
D601,612	OBT6181A	SID 1SS53	849,850					
613,620			851,852					
621,622			853,854					
625			855,856					

6.14. Logic P.C.B. Ass'y

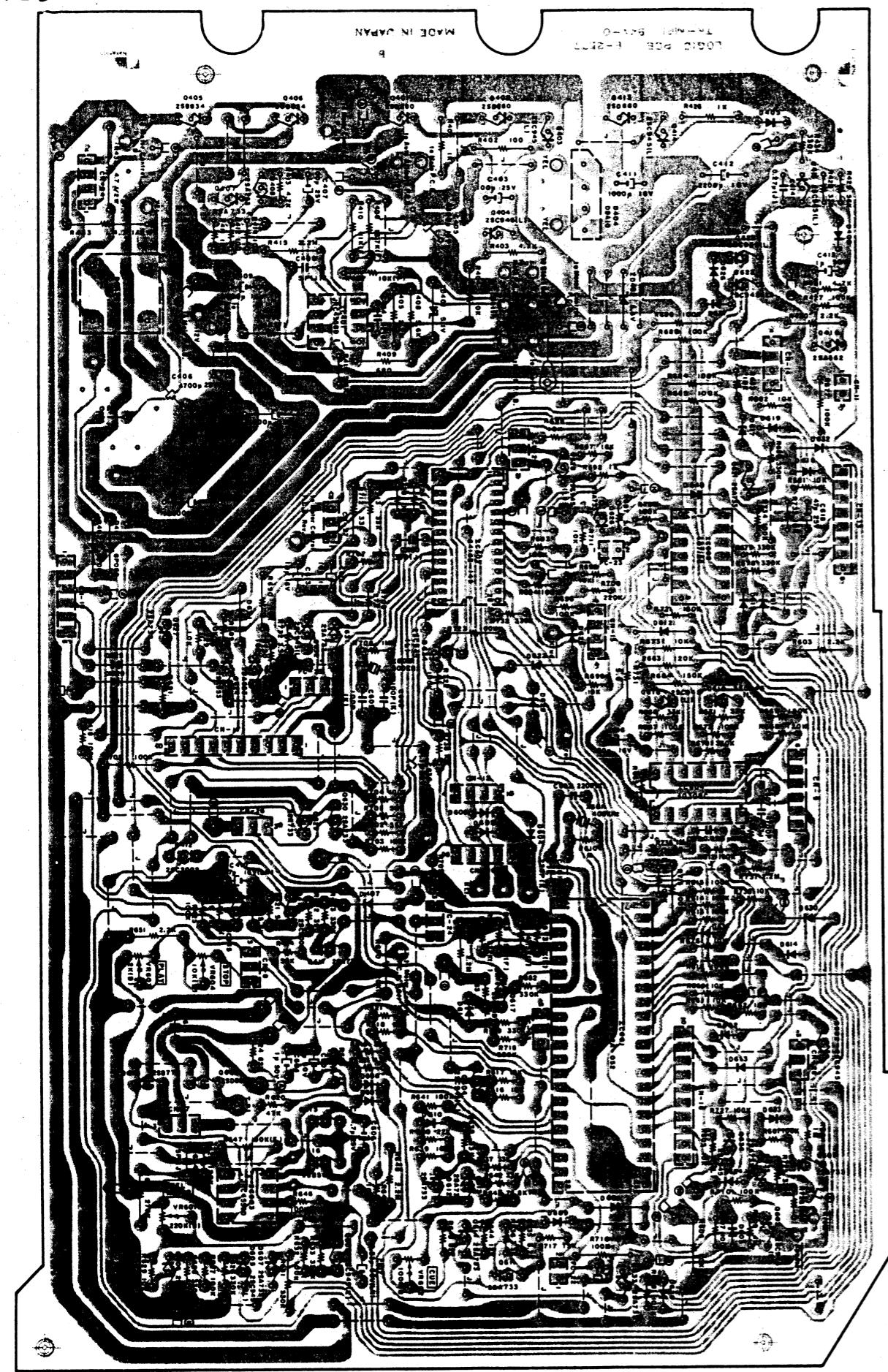


Fig. 6.14.1 Serial No.: A80102201

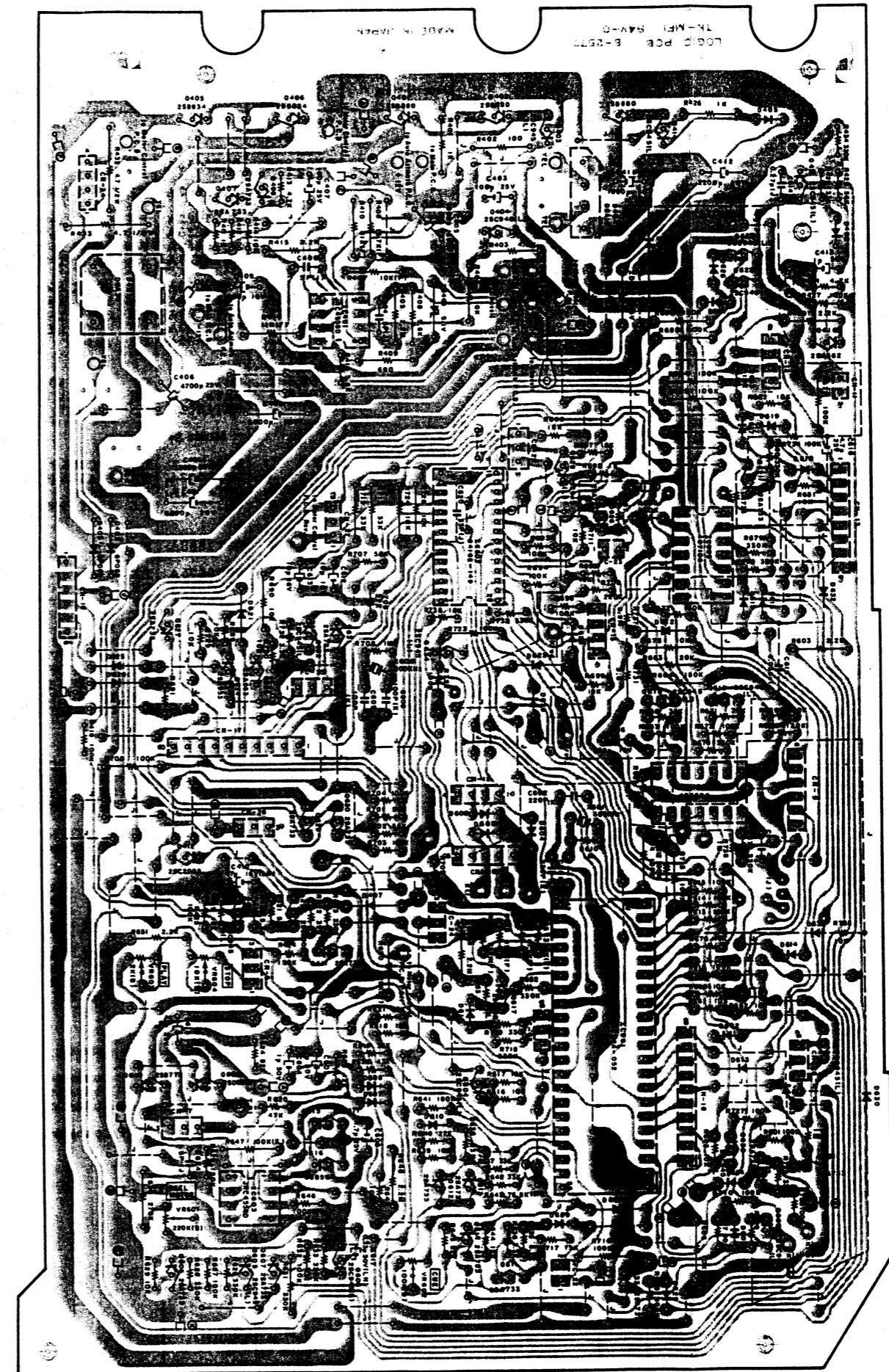


Fig. 6.14.2 Serial Nos.: A80101001 - A80102200

6.15. Auto Azimuth P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
- Tone Osc.								
IC721	OB06127A	IC RC4559D	D821-827	OBT6398A	SiD 1SS176 (21)	R805,807	OBT5615A	RK 22K 1/4W J
IC722	OB06219A	IC μ PD4081BC	832-835			903,904	OBT1857A	RK 1K 1/4W J
Q721	OBT1872A	TR 2SC945L (P,Q)	840			905		
D721,722	OBT6181A	SiD 1SS53	842-846			R706,806	OBT5615A	RK 22K 1/4W J
L721	OB03919B	Inductor 36mH	848,849			R708,711	OBT1857A	RK 1K 1/4W J
VR721	OB07269A	Semi-fixed VR 50K	850,851	D841	OB06181A	SiD 1SS53	808,811	
VR722	OB07270A	Semi-fixed VR 20K	VR822	OB07269A	Semi-fixed VR 50K	R709,809	OBT1682A	RK 6.8K 1/4W J
R721,722	OBT9315A	RM 332K 1/4W F	VR823,824	OB07256A	Semi-fixed VR 10K	R710,810	OBT5625A	RK 220K 1/4W J
723			R821	OB22512Y	RM 316K 1/4W F	R712,812	OBT9432A	RM 8.25K 1/4W F
R724	OBT9583A	RM 97.6K 1/4W F	R822,830	OB22265Y	RM 2.2K 1/4W F	R713,714	OBT5627A	RM 330K 1/4W J
R725,726	OBT1889A	RK 100K 1/4W J	R823,831	OB22457Y	RM 100K 1/4W F	R715,815	OBT9510A	RM 66.5K 1/4W F
732			R824,832	OB22256Y	RM 1.8K 1/4W F	R716,816	OBT9305A	RM 100K 1/4W F
R727	OBT5615A	RK 22K 1/4W J	OBT9701A	RK 10K 1/6W J	R718,818	OBT5577A	RM 330 1/4W J	
R728	OBT5627A	RK 330K 1/4W J			R902	OBT9709A	RK 22K 1/6W J	
R729,730	OBT5508A	RK 56K 1/4W J	R825,828		C701,703	OBT1405A	CE 1 μ 50V	
731								
R733	OBT9527A	RK 130K 1/4W J	R833,836					
R734	OBT5676A	RK 390K 1/4W J	R847,848					
R735	OBT1682A	RK 6.8K 1/4W J	R829	OBT22507Y	RM 287K 1/4W F	R704,801	OBT9844A	CF 1000P 50V J
R736	OBT5622A	RK 2.2K 1/4W J	R838,839	OBT9725A	RK 100K 1/6W J	803,804	OBT9218A	CE 47 μ 16V (LN)
C721,722	OBT1400A	CE 100 μ 16V	R899,920			C702,802	OBT1862A	CE 22 μ 16V
C723	OBT9836A	CP 360P 100V J	R900,928			C901		
C724	OBT9538A	CP 0.018 μ 100V G	R930,931					
C725	OBT9861A	CF 0.027 μ 50V J	R840,842	OBT9749A	RK 1M 1/6W J	IC771	OB06216A	IC μ PC4556C
C726	OBT9865A	CF 0.056 μ 50V J	R854,856			Q771	OBT6013A	TR 2SA733 (P,Q)
C727	OBO9302A	C 100P 100V J	R894,921			R771,772	OBT6181A	SiD 1SS53
C728	OBT9863A	CF 0.1 μ 50V J	R841	OBT9707A	RK 18K 1/6W J	R775,777	OBT5625A	RK 220K 1/4W J
C729	OBT9860A	CF 0.022 μ 50V J	R845,846	OBT9733A	RK 220K 1/6W J	R778,779	OBT1888A	RK 10K 1/4W J
C730	OBT9848A	CF 220OP 50V J	R849,852			R773,774	OBT5675A	RK 3.9K 1/4W J
C731	OBT9322A	CP 330P 100V J	R850,855	OBT9677A	RK 1K 1/6W J	R780	OBT9380A	RK 1.5M 1/4W J
- Fader -								
IC741	OB06216A	IC μ PC4556C	R853	OBT9681A	RK 1.5K 1/6W J	R782	OBT5509A	RK 33K 1/4W J
Q741,744	OB06013A	TR 2SA733 (P,Q)	R869	OBT9687A	RK 2.7K 1/6W J	R783,785	OBT1889A	RK 100K 1/4W J
745,747	OBT1872A	TR 2SC945L (P,Q)	R874	OBT1889A	RK 100K 1/4W J	R787	OBT5776A	RK 1M 1/4W J
Q742,743			R875,929	OBT9709A	RK 22K 1/6W J	C771	OBT9854A	CF 6800P 50V J
746	ZD741	ZD 5.6V RD5.6EB2	R875,929	OBT5627A	RK 330K 1/4W J	C772,774	OBT9282A	CC 100P 50V K
ZD741	OBT6290A	ZD 5.6V RD5.6EB2	R876,878	OBT5671A	RK 2.2M 1/4W J	C773,775	OBT9222A	CE 0.47 μ 50V (LN)
D741,742	OBT6181A	SiD 1SS53	R879	OBT9653A	RK 100 1/6W J	OBT9148A	CE 1 μ 25V (LN)	
743,744	OBT5676A	RK 390K 1/4W J	R880	OBT9671A	RK 560 1/6W J	OBT9223A	CE 1 μ 50V (LN)	
R741,743			R891	OBT9743A	RK 560K 1/6W J	OBT9856A	CF 0.01 μ 50V J	
746	R742,744	OBT5640A	R927	OBT9737A	RK 330K 1/6W J	OBT1888A	RK 10K 1/4W J	
R745,763	OBT5692A	RK 180K 1/4W J	R926	OBT9719A	RK 56K 1/6W J	R776,781	OBT5675A	RK 3.9K 1/4W J
R747	OBT5641A	RK 68K 1/4W J	R932	OBO1857A	RK 1K 1/4W J	R782	OBT9380A	RK 1.5M 1/4W J
R748,751	OBT1888A	RK 47K 1/4W J	R935	OBT9705A	RK 15K 1/6W J	R783,785	OBT5509A	RK 33K 1/4W J
754,765	OBT5668A	RK 10K 1/4W J	R936	OBT9685A	RK 2.2K 1/6W J	R787	OBT1889A	RK 100K 1/4W J
R749,750	OBT5668A	RK 82K 1/4W J	C821,826	OBO9302A	C 100P 100V J	C771	OBT9854A	CF 6800P 50V J
R752	OBT1889A	RK 100K 1/4W J	C823,828	OBT9489A	CP 5600P 100V G	C772,774	OBT9282A	CC 100P 50V K
R753	OBT5621A	RK 120K 1/4W J	C824,829	OBT9686A	CF 0.1 μ 50V J	C773,775	OBT9222A	CE 0.47 μ 50V (LN)
R755	OBT5743A	RK 27K 1/4W J	C831,856	OBT9370A	CC 33P 50V J	OBT9148A	CE 1 μ 25V (LN)	
R756,764	OBT5622A	RK 2.2K 1/4W J	C832	OBT9849A	CF 270OP 50V J	R911,912	OBT6231A	ZD 11V RD11EB2
767	OBT1857A	RK 1K 1/4W J	C833,834	OBT9223A	CE 1 μ 50V (LN)	ZD911,912	OBT6268A	ZD 5.6V RD5.6EB3
R757	OBT5691A	RK 390 1/4W J	C841,842	OBT9332A	CE 2.24 50V (LN)	ZD913	OBT6181A	SiD 1SS53
R758	OBT5576A	RK 470 1/4W J	C845	OBT9484A	CE 10 μ 25V (LN)	R911,913	OBT9215A	RF 100 1/4W J
R759	OBT1887A	RK 5.6K 1/4W J	C846	OBT9848A	CF 220OP 50V J	R912,914	OBT9321A	RF 4.7 1/4W J
R760,766	OBT1681A	RK 3.3K 1/4W J	C853	OBT9147A	CE 3.3 μ 50V (LN)	R915,916	OBT5743A	RF 27K 1/4W J
R761	OBT5627A	RK 330K 1/4W J	C854,855	OBT9163A	CE 10 μ 16V (BP)	R917,918	OBT1889A	RF 100K 1/4W J
R762	OBT1674A	CE 10 μ 25V	C857	OBT9137A	CE 22 μ 25V (LN)	R920,922	OBT5627A	RK 330K 1/4W J
C741	OBT1674A	CE 10 μ 25V	C859,860	OBT9288A	CC 100P 50V K	R919	OBT5615A	RK 22K 1/4W J
C742	OBT9844A	CF 1000P 50V J	OBT9490A	OBT9490A	CP 0.01 μ 100V G	R921	OBT1857A	RK 1K 1/4W J
C743	OBT1409A	CE 47 μ 25V	CN5	OBT8656A	2P-T Post	R923	OBT1392A	CE 470 μ 16V
C744	OBT9852A	CF 4700P 50V J	CN6	OBT8653A	3P-T Post	C911,912		
- Azimuth -								
IC821	OB06443A	IC NJM082D	IC701,801	OB06144A	IC μ PD4066BC	CN19,33	OB02349A	Auto Azimuth P.C.B.
IC822	OB06387A	IC NJM2043DD	IC901	OB06216A	IC μ PC4556C	CN20	OB02350A	4P-JP Connector
IC823	OB06216A	IC μ PC4556C	Q701,801	OBT1872A	TR 2SC945L (P,Q)	CN22,23	OB02336A	5P-JP Connector
IC824	OB06178A	IC μ PD4011BC	ZD701,801	OBT6058A	ZD 5.1V YZ051	CN24,25	OB02348A	2P-JP Connector
IC825	OB06358A	IC μ PD4013BC	D701,702	OBT6181A	SiD 1SS53	32,35		
IC826	OB06144A	IC μ PD4066BC	703,801					
IC827	OB06124B	IC RC4558D						

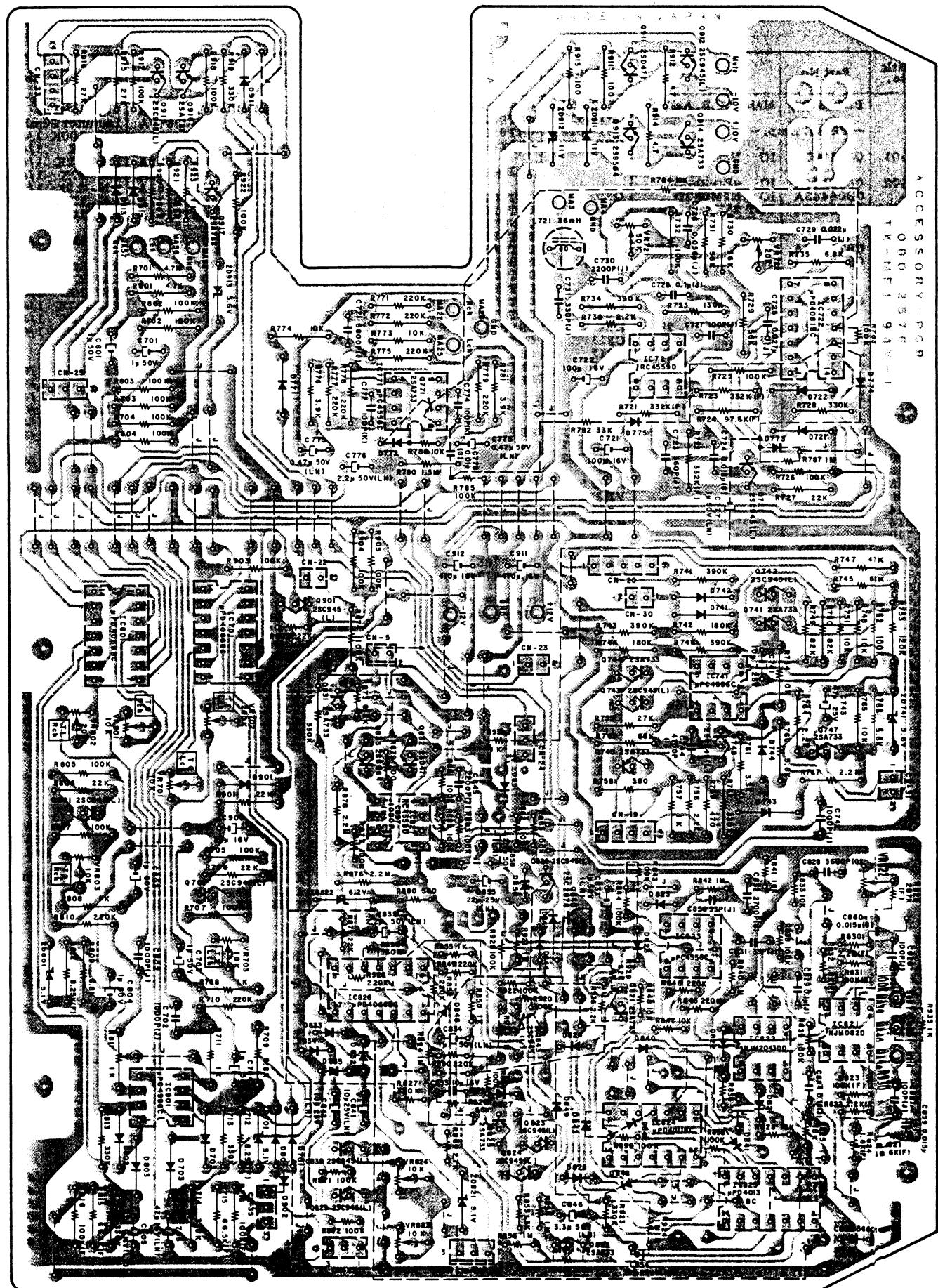


Fig. 6.15.2 Serial Nos.: A80101001 - A80102200

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA04870A	Main P.C.B. Ass'y	C517,617 C518,618 C519,619 CN2	OBT9410A OBT9322A OBT9286A OBT02281A	CP 2200P 100V G CP 330P 100V J CC 470P 50V K 4P-T Post	D102,202 L101,201 R101,201 R102,202 R103,203 R104,204 R106,206 R107,207 R108,120 R109,110 R110,220 R111,211 R112,212 R114,214 R115,215 R116,216 R117,125 R118,218 R119,219 R121,221 R123,223 R124,224 R126,130 R127,129 R131,132 R133,233 R134,234 R135,235 R136,236 C101,115 C103,203 C104,105 C106,206 C108,208 C109,209 C110,114 C111,211 C112,212 C116,216 C117,217 C118,122 C119,121 C120,220 C123,223 C124,125 C126,226 C127,227 C128,228	OBT6398A OBO6676A OBT1889A RK 100K 1/4W J RK 1K 1/4W J RK 2.2K 1/4W J RK 27K 1/4W J RK 3.3K 1/4W J RK 1K 1/6W J RK 10K 1/6W J	SiD 1SS176 Inductor 36mH G RK 100K 1/4W J RK 1K 1/4W J RK 2.2K 1/4W J RK 27K 1/4W J RK 3.3K 1/4W J RK 1K 1/6W J RK 10K 1/6W J
IC301,501 601	OB11005A	IC NJM072DE			— Bias Osc. —			
IC502,602	OB06144A	IC μ PD4066BC	Q302	OBT6013A	TR 2SA 733 (P,Q)	R106,206	OBT1681A	SiD 1SS176 Inductor 36mH G RK 100K 1/4W J RK 1K 1/4W J RK 2.2K 1/4W J RK 27K 1/4W J RK 3.3K 1/4W J RK 1K 1/6W J RK 10K 1/6W J
IC701	OB06443A	IC NJM082D	Q303	OBT6202A	TR 2SA 562TM (Y)	R107,207	OBT9677A	
Q501,502 601,602	OB06376A	FET 2SK170 (GR)	T301	OBT06718A	Bias Osc. Unit	R108,120	OBT9701A	
701,702			R311	OBT1888A	RK 10K 1/4W J	R109,110		
ZD301	OBT6418A	ZD 8.2V RD8.2JB2	R312	OBT5692A	RK 68K 1/4W J	R110,220	OBT9502A	RM 1M 1/4W F
L501,502 601,602	OB06717A	Trap Unit	R313,314	OBT09936A	RF 10 1/2W J	R111,211	OBT9197A	RM 820K 1/4W F
701			R315	OBT5575A	RK 560 1/4W J	R112,212	OBT9766A	RM 2.2M 1/4W F
VR501,502 601,602	OB07256A	Semi-fixed VR 10K	R316	OBT1681A	RK 3.3K 1/4W J	R114,214	OBT1888A	RM 10K 1/4W J
R306			R317	OBT5560A	RK 18K 1/4W J	R115,215	OBT22305Y	RM 4.7K 1/4W F
R307	OBT9701A	RK 2.2K 1/4W J	R318	OBT9701A	RK 10K 1/6W J	R116,216	OBT22351Y	RM 12K 1/4W F
R308	OBT1857A	RK 10K 1/6W J	C311	OBT9405A	CE 100 μ 16V	R117,125	OBT9717A	RM 47K 1/6W J
R341,342	OBT9737A	RK 1K 1/4W J	C312	OBT9844A	CF 1000P 50V J	R118,218	OBT9673A	RM 680 1/6W J
R501,511 601,611	OBT9725A	RK 330K 1/6W J	CN1	OB08656A	2P-T Post	R119,219	OBT9683A	RM 1.8K 1/6W J
701,707					— Line Input —	R120,220	OBT22443Y	RM 75K 1/4W F
R502,512 602,612	OB22296Y	RM 1/4W F	Q121,122	OBT1872A	TR 2SC945L (P,Q)	R121,221	OBT9737A	RM 330K 1/6W J
702,708			123,221			R122,222	OBT5668A	RM 82K 1/4W F
R503,513 603,613			222,223			R123,223	OBT5627A	RM 330K 1/4W F
703,709	OB22104Y	RM 80.6 1/4W F	301			R124,224	OBT5668A	RM 82K 1/4W F
R504,514 604,614			L102,202	OB06690A	L-C Block	R125,225	OBT5676A	RM 390K 1/4W J
704,710	OB09785A	RK 4.7M 1/4W J	VR301	OBT07257A	Semi-fixed VR 100K	R126,226		
R505,515 605,615	OBT22512Y	RM 316K 1/4W F	R181,281	OBT9733A	RK 220K 1/6W J	R127,229	OBT5676A	RF 82 1/4W J
705,711			R182,282	OBT9653A	RK 100 1/6W J	R128,229		
R506,516 606,616	OB22353Y	RM 12.4K 1/4W F	R183,283	OBT9725A	RK 100K 1/6W J	R129,229	OBT09162A	RF 82 1/4W J
706,712			303	OBT9705A	RK 15K 1/6W J	R130,230	OBT9705A	RF 82 1/4W J
R507,517 607,617	OBT9661A	RK 220 1/6W J	R184,284	OBT9677A	RK 1K 1/6W J	R131,231	OBT909162A	RF 82 1/4W J
R508,518 608,618	OBT9669A	RK 470 1/6W J	R185,285	OBT9705A	RK 15K 1/6W J	R132,232	OBT9863A	CF 0.039 μ 50V J
R509,519 609,619	OBT1682A	RK 6.8K 1/4W J	R186,286	OBT9687A	RK 2.7K 1/6W J	R133,233	OBT9863A	CF 0.039 μ 50V J
R715,716	OBT9653A	RK 100 1/6W J	R187,287	OBT9698A	RK 7.5K 1/6W J	R134,234	OBT9863A	CF 0.039 μ 50V J
C304	OBT1412A	CE 10 μ 16V	C161,261	OBT5622A	RK 2.2K 1/4W J	R135,235	OBT9863A	CF 0.039 μ 50V J
C305	OBT1400A	CE 100 μ 16V	C162,262	OBT9653A	RK 100 1/6W J	R136,236	OBT9863A	CF 0.039 μ 50V J
C325,326	OBT9291A	CC 0.022 μ 50V Z	C163,263	OBT9725A	RK 100K 1/6W J	R137,237	OBT9863A	CF 0.039 μ 50V J
C501,504 601,604	OBT9933A	CE 2.2 μ 50V (LN)	C164,264	OBT9849A	CF 2700P 50V J	R138,238	OBT9863A	CF 0.039 μ 50V J
701,703			C165,265	OBT9845A	CF 1200P 50V J	R139,239	OBT9863A	CF 0.039 μ 50V J
C502,505 602,605	OBT9312A	CP 0.01 μ 100V G	C166,266	OBT9288A	CC 1000P 50V K	R140,240	OBT9852A	CF 4700P 50V J
702,704			C167,267	OBT9270A	CP 470P 100V J	R141,241	OBT9852A	CF 4700P 50V J
C503,506 603,606	OBT9851A	CF 3900P 50V J	C301,302	OBT1400A	CE 100 μ 16V	R142,242	OBT1412A	CE 10 μ 16V
705			C303	OBT9850A	CF 3300P 50V J	R143,243		
CN3	OBL8654A	4P-T Post		OBT9850A	CC 0.01 μ 50V Z	R144,244	OBT9868A	CF 0.1 μ 50V J
CN4	OBL8642A	6P-T Post		OBD320	Photocoupler	R145,245	OBT9870A	CF 0.15 μ 50V J
				OBD325B	MCD7214F	R146,246	OBT9872A	CF 0.22 μ 50V J
					— Line Amp. —	R147,247	OBT9870A	CF 0.22 μ 50V J
						R148,248	OBT9856A	CF 0.01 μ 10V
						R149,249	OBT9862A	CF 0.01 μ 10V
						R150,250	OBT9862A	CF 0.039 μ 50V J
IC302	OB06387A	IC NJM2043DD	IC303	OB11004A	IC NJM2041DD	R151,251	OBT6382A	IC NE562
Q503,504 603,604	OBT6299A	TR 2SC2878	Q505,605	OBT1872A	TR 2SC945L (P,Q)	R152,161	OBT6457A	IC NJM072DD
L503,603	OB00068A	Trap Coil 10.5mH	D121,221	OBT6398A	SiD 1SS176	OBT1872A	TR 2SC945L (P,Q)	(8)
L504,604	OBT6705A	Trap Coil 1.05mH	R541,543	OB06676A	Inductor 36mH G	ZD106,107	OBT6232A	ZD 9.1V RD9.1EB2
R521,529 621,629	OBT9705A	RK 15K 1/6W J	R542,546	OBT1857A	RK 220K 1/4W J	R157,257	OBT6181A	SiD 1SS53
R522,622	OBT5560A	RK 18K 1/4W J	R544,644	OBT9535A	RM 9.76K 1/4W F	R158,258	OBT6398A	SiD 1SS176
R523,526 623,626	OBT9731A	RK 180K 1/6W J	R545,645	OBT9900A	RM 4.99K 1/4W F	R159,259	OBT1889A	RK 100K 1/4W J
R524,624	OBT9653A	RK 100 1/6W J	R547,647	OBT9701A	RK 10K 1/6W J	R160,260	OBT1889A	RK 100K 1/4W J
R527,627	OBT22410Y	RM 39.2K 1/4W F	R548,648	OBT9749A	RK 1M 1/6W J	R161,261	OBT1889A	RK 100K 1/4W J
R528,628	OBT22296Y	RM 3.92K 1/4W F	C521,621	OBT9814A	CE 1 μ 50V (LN)	R162,262	OBT1889A	RK 100K 1/4W J
R530,630	OBT9673A	RK 680 1/6W J	C522,622	OBT9815A	CE 47u 6.3V (LN)	R163,263	OBT1889A	RK 100K 1/4W J
R531,631	OBT224247Y	RM 1.5K 1/4W F	C523,623	OBT9847A	CF 1800P 50V J	R164,264	OBT1889A	RK 100K 1/4W J
R532,632	OBT1888A	RK 10K 1/4W J			— Encoder —	R165,265	OBT1889A	RK 100K 1/4W J
R533,633	OBT5936A	RK 10 1/4W J	IC101,201	OB06382A	IC NE652	R166,266	OBT1889A	RK 100K 1/4W J
R534,634	OBT9749A	RK 1M 1/4W J	IC102,202	OB06457A	IC NJM072DD	R167,267	OBT1889A	RK 100K 1/4W J
C327,328	OBT1405A	CE 1 μ 50V	Q101,102	OBT1872A	TR 2SC945L (P,Q)	R168,268	OBT1889A	RK 100K 1/4W J
C511,611	OBT9862A	CF 0.033 μ 50V J	103,104			R169,269	OBT1889A	RK 100K 1/4W J
C512,520 612,620	OBT9814A	CE 1 μ 50V (LN)	105,201			R170,270	OBT1889A	RK 100K 1/4W J
C513,613	OBT9815A	CE 47 μ 6.3V (LN)	204,205	OBT6232A	ZD 9.1V RD9.1EB2	R171,271	OBT1889A	RK 100K 1/4W J
C514,614	OBT9867A	CF 0.082 μ 50V J	ZD101,102			R172,272	OBT1889A	RK 100K 1/4W J
C515,615	OBT9854A	CF 6800P 50V J	201,202	OBT6232A	ZD 9.1V RD9.1EB2	R173,273	OBT1889A	RK 100K 1/4W J
C516,616	OBT9850A	CF 3300P 50V J	D101,103	OBT6181A	SiD 1SS63	R174,274	OBT1889A	RK 100K 1/4W J
			201,203			R175,275	OBT1889A	RK 100K 1/4W J

6.16. Main P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
R155,255	OBT9685A	RK 2.2K 1/6W J
R156,256	OBT9713A	RK 33K 1/6W J
R157,257	OBT9693A	RK 4.7K 1/6W J
R158,258	OBT9701A	RK 10K 1/6W J
R159,163 259,263	OBT5641A	RK 47K 1/4W J
R160,260	OBT5668A	RK 82K 1/4W J
R162,164 262,264	OBT5676A	RK 390K 1/4W J
R166,167 266,267	OBT9162A	RF 82 1/4W J
R168,268	OBT9749A	RK 1M 1/6W J
C131,231	OBT9933A	CE 2.2μ 50V (LN)
C133,233	OBT9852A	CF 4700P 50V J
C134,234	OBT9240A	CP 0.033μ 100V G
C136,140 235,240 329	OBT1412A	CE 10μ 16V
C136,144 236,244	OBT9866A	CF 0.068μ 50V J
C137,237	OBT9814A	CE 1μ 50V (LN)
C139,239	OBT9191A	CP 4700P 100V G
C141,241	OBT9286A	CC 470P 50V K
C142,242	OBT9856A	CF 0.01μ 50V J
C143,243	OBT9864A	CF 0.047μ 50V J
C145,149 245,249	OBT9862A	CF 0.033μ 50V J
C146,148 246,248	OBT9868A	CF 0.1μ 50V J
C147,247	OBT9870A	CF 0.15μ 50V J
C150,250	OBT9872A	CF 0.22μ 50V J
C151,152 251,252	OBT5885A	CE 100μ 10V
C153,253	OBT9302A	C 100P 50V J
C154,254	OBT9262A	CP 3000P 100V J
C310	OBT1405A	CE 1μ 50V
— Logic Interface —		
Q304,307 308	OBT1872A	TR 2SC945L (P,Q)
Q305,306	OBT6013A	TR 2SA733 (P,Q)
D301,302 304,305	OBT6181A	SID 1SS53
313,314	OBT6398A	SID 1SS176
D303,311 312	OBT1889A	RK 100K 1/4W J
R318,320 322,326	OBT5509A	RK 33K 1/4W J
R319	OBT5641A	RK 47K 1/4W J
R321,331 332	OBT1888A	RK 10K 1/4W J
R323	OBT5743A	RK 27K 1/4W J
R324	OBT1857A	RK 1K 1/4W J
R325	OBT9717A	RK 47K 1/6W J
R327	OBT5575A	RK 560 1/4W J
R328	OBT9749A	RK 1M 1/6W J
R333,334	OBT1406A	CE 2200P 16V
C313,314	OBT9292A	CC 0.1μ 50V Z
C322,323 324	OBT9277A	IC 10P 50V J
— Headphone Amp. —		
IC304	OB06217A	IC NJM4560D
Q506,606	OB06066A	TR 2SD471 (L,M)
Q507,607	OB06069A	TR 2SB564 (L,M)
R551,651	OBT9653A	RK 100 1/6W J
R552,553 652,653	OBT1889A	RK 100K 1/4W J
R554,654	OBT9645A	RK 47 1/6W J
R555,655	OBO9331A	RF 8.2 1/4W J
C531,631	OBT9277A	CC 10P 50V J
C315,316	OBT1405A	CE 1μ 50V
— Miscellaneous —		
CN21,37	OB02575B	Main P.C.B.
CN36	OBO2348A	3P-JP Connector
FC21	OBO2350A	5P-JP Connector
FC30	OBO5343B	3P Flat Cable
FC31	OBO5334B	2P Flat Cable
FC32,47	OBE2032A	2P Flat Cable
FC33	OBO5342B	3P Flat Cable
FC37	OBO5356B	4P Flat Cable
FC46	OBO5341B	3P Flat Cable
FC48	OBO5344B	3P Flat Cable
FC49	OBO5347B	3P Flat Cable
	OBO5335B	2P Flat Cable
	OB08515A	Insu-Lock (5)

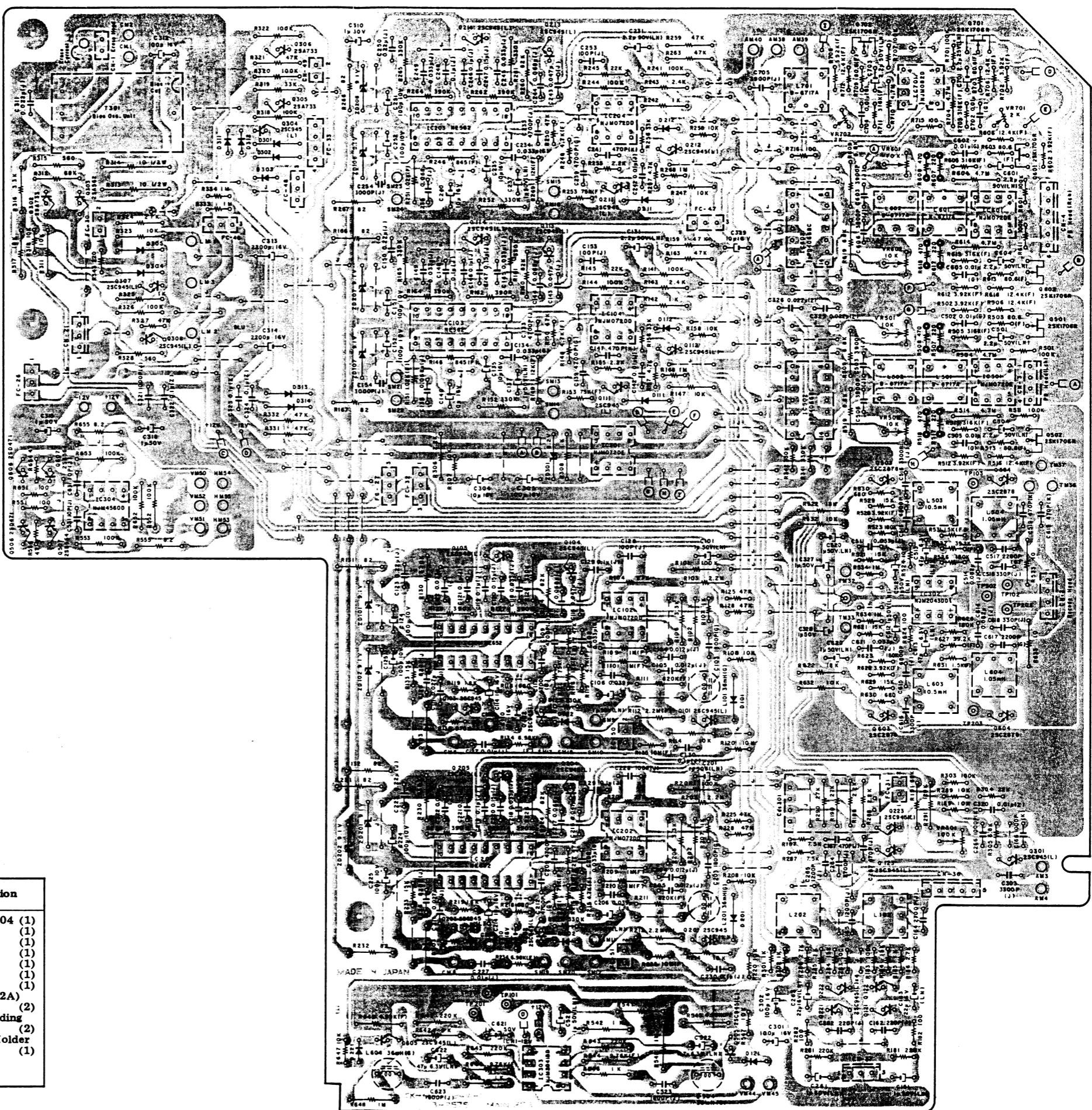


Fig. 6.16.1 Serial No.: A80102201 -

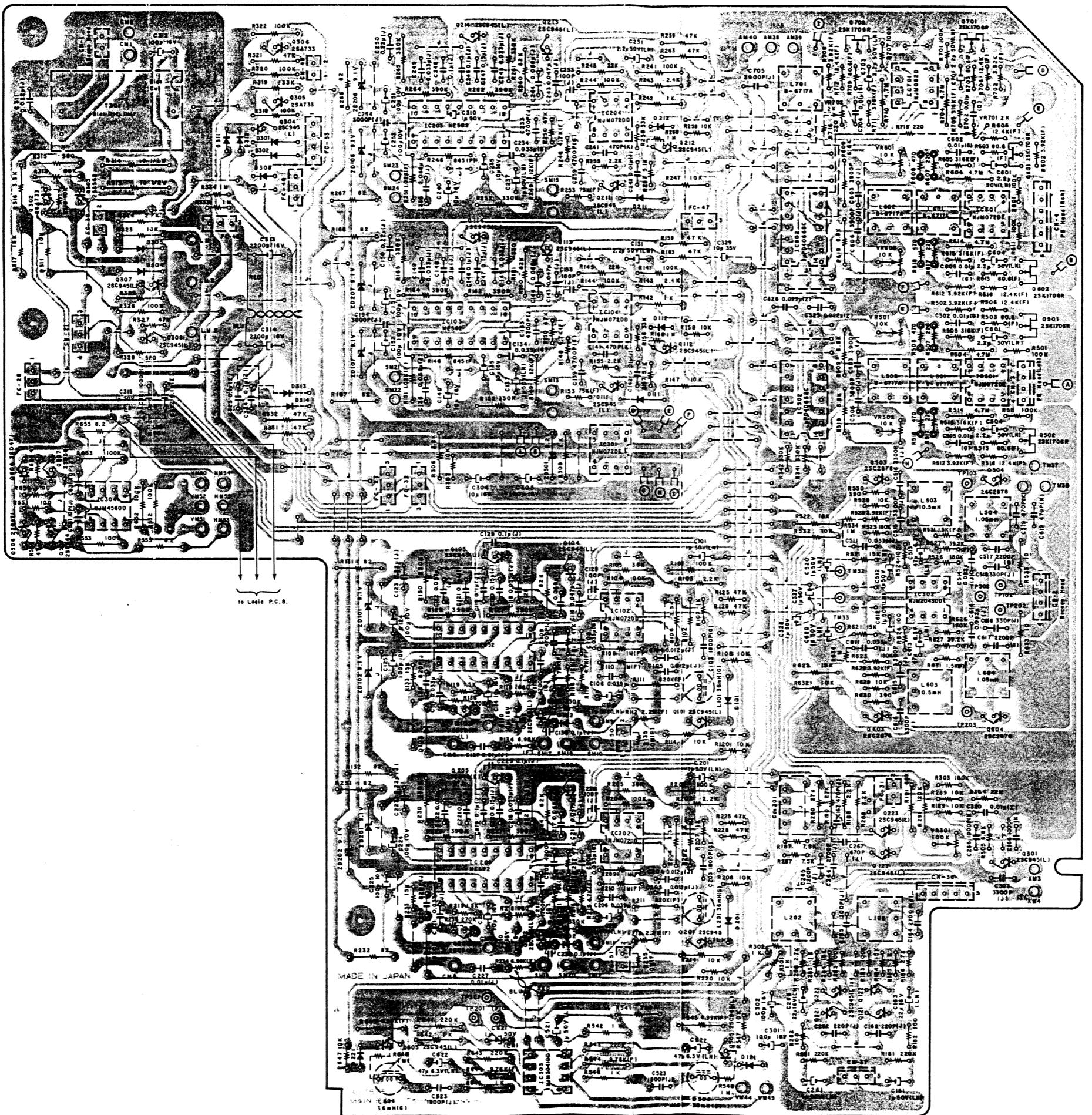


Fig. 6.16.2 Serial Nos.: A80101001 - A80102200

7. SCHEMATIC DIAGRAMS

7.1. Attention to Servicemen

(1) Parts Replacement

Following parts shall be replaced with the specified ones.
Refer to the parts list.

- (a) Power Supply Circuit
Power Cord
Power Transformer: T1
- (b) Power Switch P.C.B. Ass'y
Power Switch: SW1
Spark Killer: M2
- (c) Fuse P.C.B. Ass'y
Fuses: F01, 02, 03
- (d) Logic P.C.B. Ass'y
Power Transistors: Q401, 402, 405, 406, 410, 412, 413, 416, 609, 610, 615, 616
Diode Bridges: D401, 404
Fail Safe Type Resistors: R432, 433, 731
- (e) Main P.C.B. Ass'y
Power Transistors: Q303, 506, 606
Fail Safe Type Resistors: R131, 132, 166, 167, 231, 232, 266, 267, 313, 314, 555, 655
- (f) Auto Azimuth P.C.B. Ass'y
Power Transistors: Q832, 833, 911, 913
Fail Safe Type Resistors: R911, 912, 913, 914
- (g) Motor Control P.C.B. Ass'y
Power Transistors: Q518, 519, 520, 521, 522, 523, 524, 525, 526
Fail Safe Type Resistors: R572, 573, 582, 583
- (h) Shut-off P.C.B. Ass'y
Fail Safe Type Resistor: R605
Lamp: PL602
- (i) Counter Pulse Generator P.C.B. Ass'y
Fail Safe Type Resistor: R601
Lamp: PL601

(2) Insulation Check

Before returning the repaired Nakamichi DRAGON to a customer, check to insure that the exposed parts are accurately insulated from the AC line by measuring the leakage current or the insulation resistance between them.

7.2. IC Block Diagrams

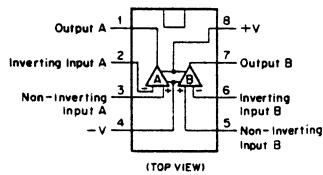


Fig. 7.2.1 Operational Amp. IC 4558D, 4559D, 4560D, 4556C, 2041DD, 2043DD, 082D, 072D

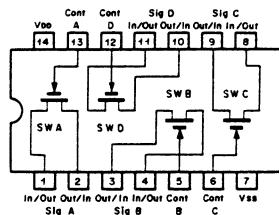


Fig. 7.2.2 Bilateral Switch C-MOS IC μ PD4066BC

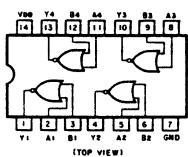


Fig. 7.2.3 NOR Gate C²-MOS IC TC40H002P

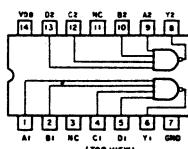


Fig. 7.2.4 NAND Gate C²-MOS IC TC40H020P

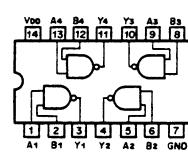


Fig. 7.2.5 NAND Gate C-MOS IC μ PD4011BC

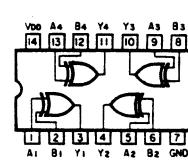


Fig. 7.2.6 Exclusive OR Gate C-MOS IC μ PD4030BC

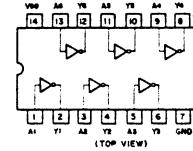


Fig. 7.2.7 Inverter C-MOS IC TC4069UBP

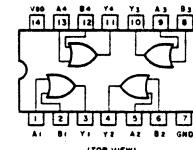


Fig. 7.2.8 OR Gate C-MOS IC μ PD4071BC

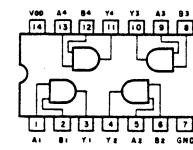


Fig. 7.2.9 AND Gate C-MOS IC μ PD4081BC

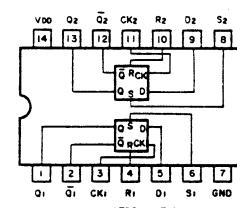


Fig. 7.2.10 D-Type Flip-Flop C-MOS IC μ PD4013BC

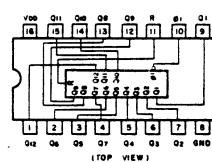


Fig. 7.2.11 Decoder C-MOS IC μ PD4040BC

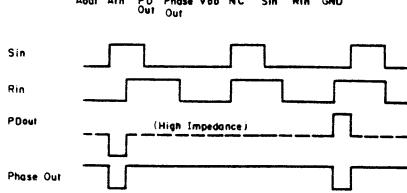
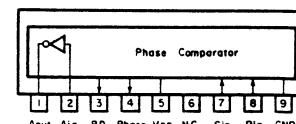


Fig. 7.2.12 Phase Comparator TC5081P

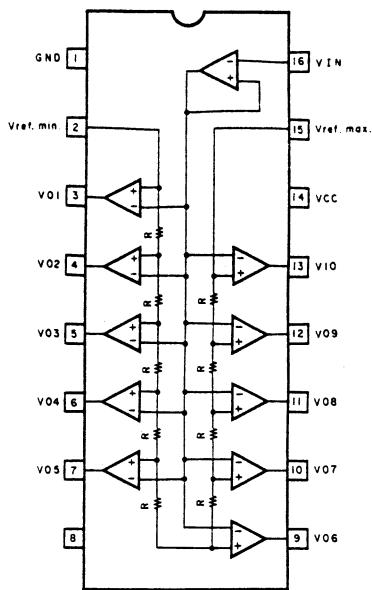
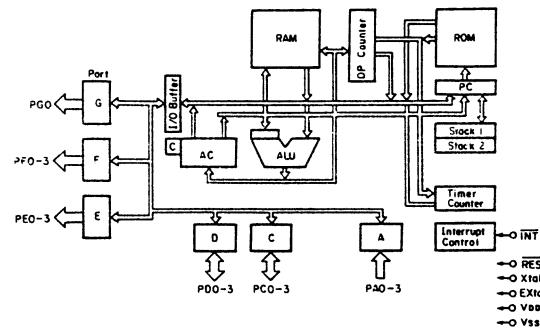


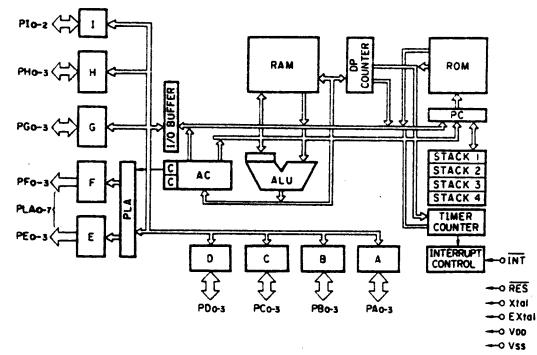
Fig. 7.2.13 Level Meter Driver TA7612AP



PDO	1	28	PC3	Xtal, Extal
PDI	2	27	PC2	Internal Oscillator
PD2	3	26	PC1	INT
PD3	4	25	PC0	RES
Extal	5	24	PA3	TEST
Xtal	6	23	PA2	PAO-3
INT	7	22	PA1	PDO-3, PFO-3
RES	8	21	PA0	PEO-3, PFO-3
PEO	9	20	Vdd	PGO
PE1	10	19	PG0	
PE2	11	18	PF3	
PE3	12	17	PF2	
TEST	13	16	PF1	
Vss	14	15	PF0	

(TOP VIEW)

Fig. 7.2.15 4-Bit Micro-processor LM6416E

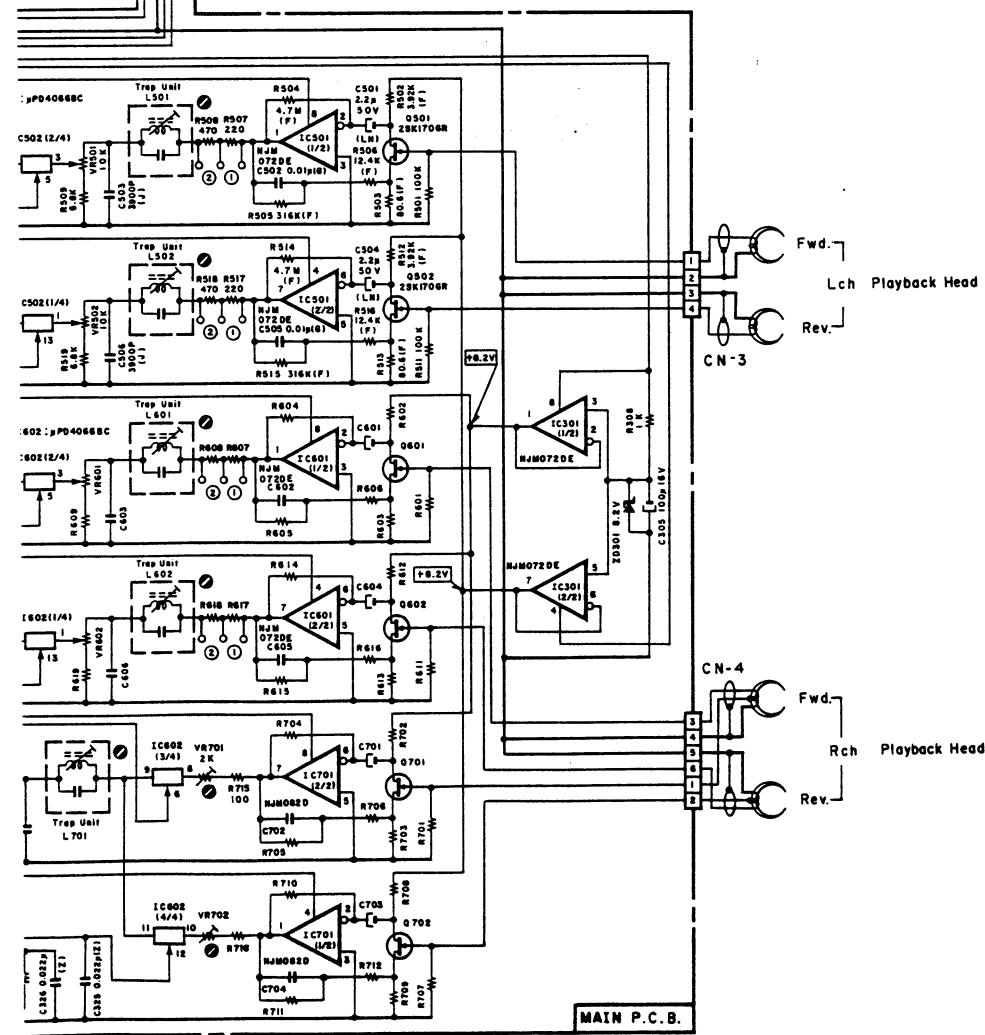
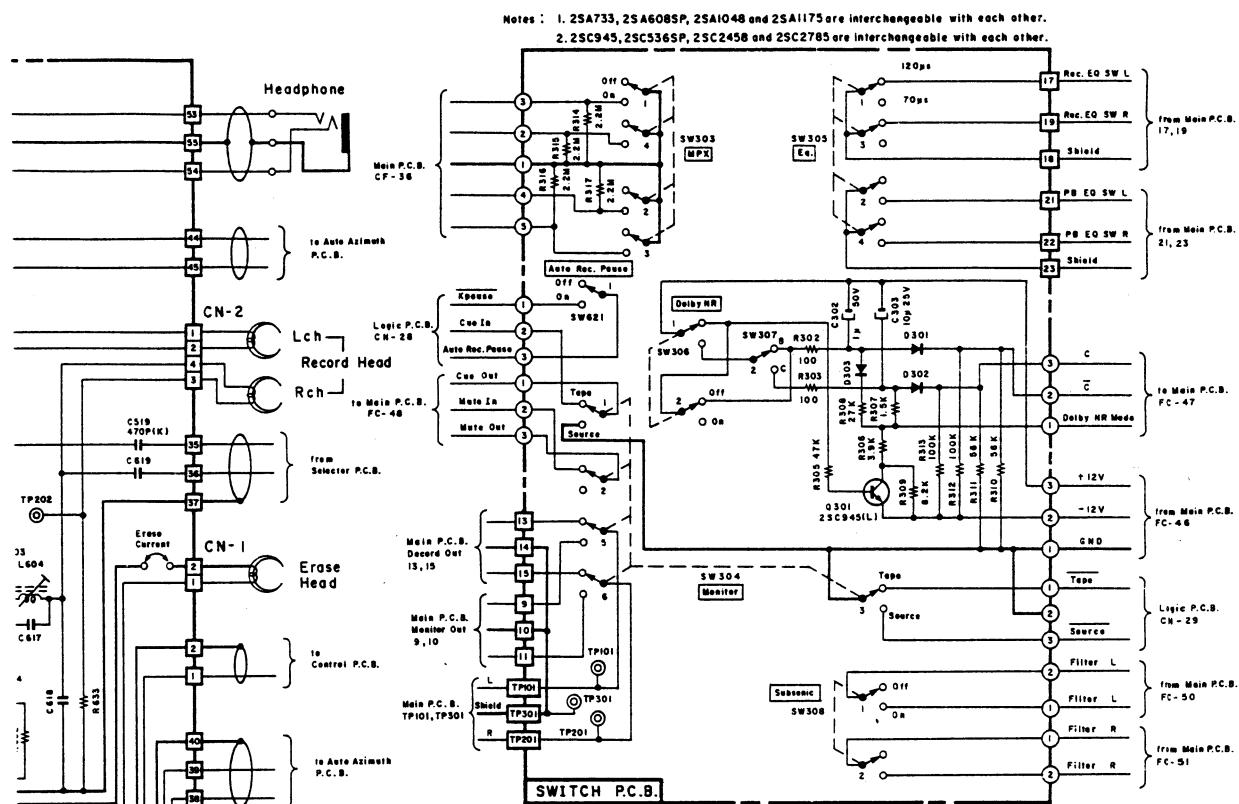


Xtal	42	— O Extal	: Crystal input for internal oscillator
PCo	41	— O Vdd(+5V)	INT : Interrupt
PC1	40	— O PB3	RES : Reset
PC2	39	— O PB2	PAo-3 : Bidirectional Port Ao-3
PC3	38	— O PB1	PBo-3 : Bidirectional Port Bo-3
INT	37	— O PB0	PCo-3 : Bidirectional Port Co-3
RES	36	— O PA3	PDo-3 : Bidirectional Port Do-3
PD0	35	— O PA2	PCo-3 (PLAo-3) : Output Port Eo-3(PLA Output 0-3)
PD1	34	— O PA1	PFo-3 (PLA4-7) : Output Port Fo-3(PLA Output 4-7)
PD2	33	— O PA0	PGo-3 : Bidirectional Port Go-3
PD3	32	— O Plz	PHo-3 : Bidirectional Port Ho-3
PEo(PLA0)	31	— O PI1	PIo-2 : Bidirectional Port Io-2
PE1(PLA1)	30	— O Pl0	TEST : Test
PE2(PLA2)	29	— O PH3	
PE3(PLA3)	28	— O PH2	
PFo(PLA4)	27	— O PH1	
PF1(PLA5)	26	— O PG0	
PF2(PLA6)	25	— O PG3	
PF3(PLA7)	24	— O PG2	
TEST	23	— O PG1	
(OV)Vss	22	— O PG0	

(TOP VIEW)

Fig. 7.2.14 4-Bit Micro-processor LM6402A

Notes: 1. Diode is 1SS53, 1S1555, or 1SS176 unless otherwise specified.
 2. Resistor and capacitor marked with * show typical value.



7.3. Amplifier Section

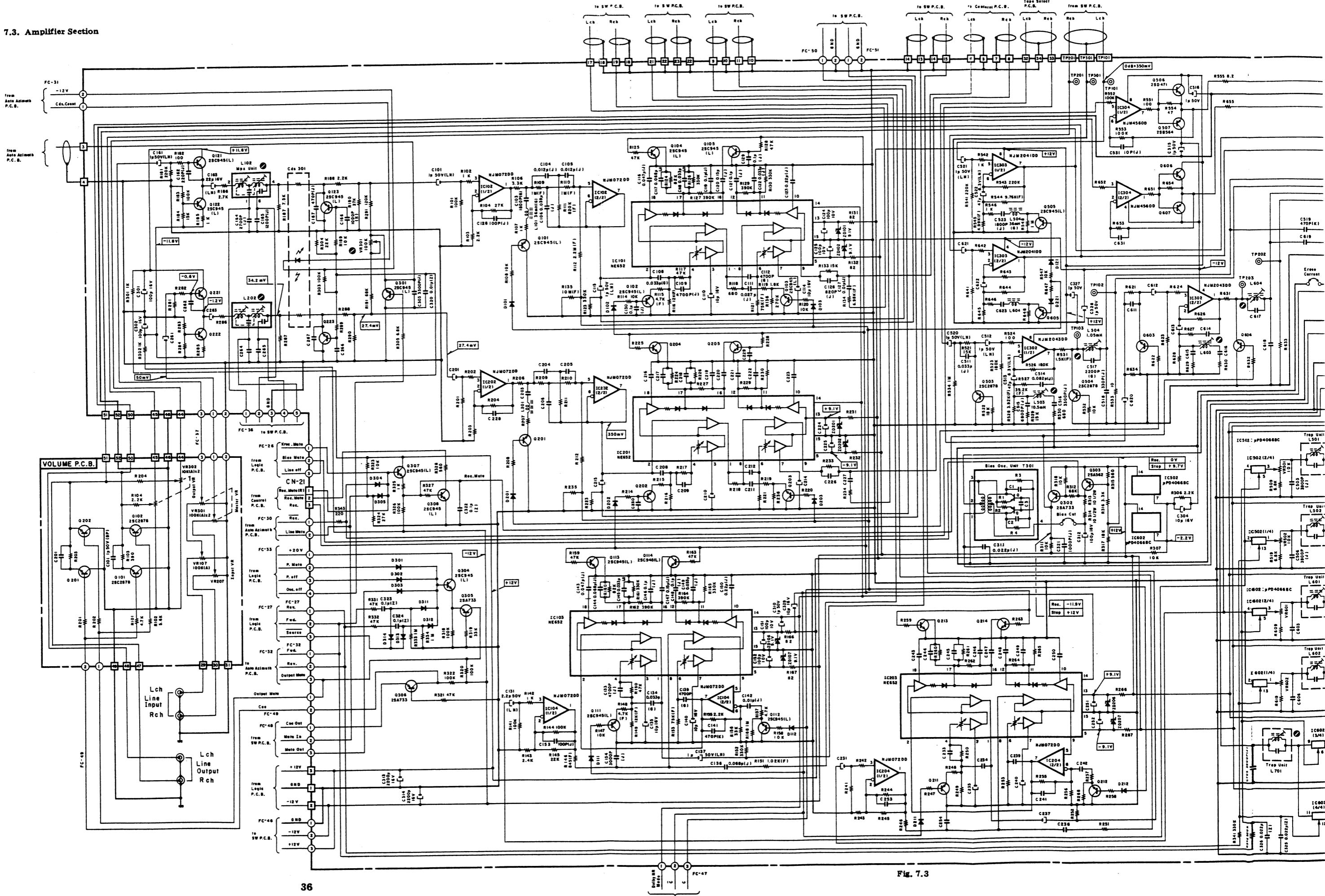
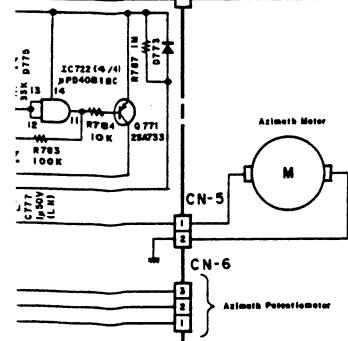
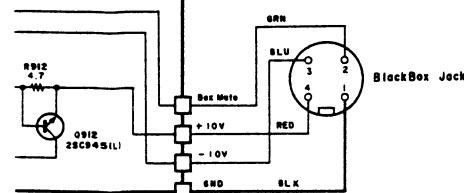
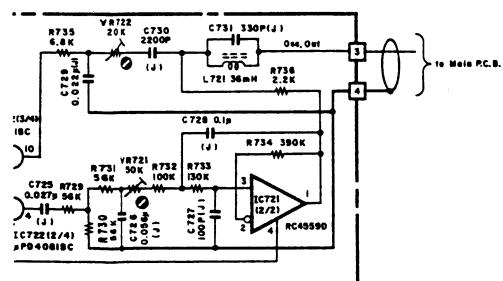
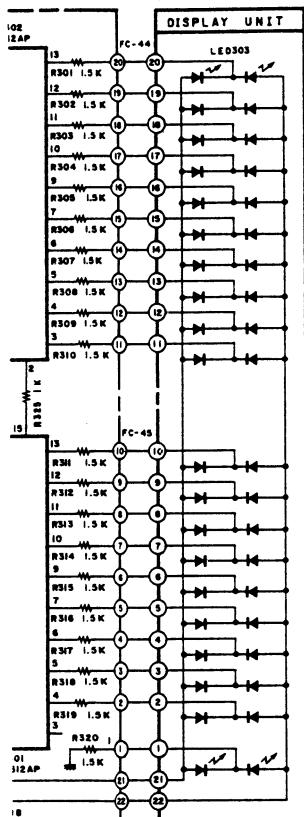


Fig. 7.3

and 2SA1175 are interchangeable with each other.
and 2SC2785 are interchangeable with each other.

Notes: 1. Diode is 1SS53, 1S1555, or 1SS176 unless otherwise specified.
2. Resistor and capacitor marked with * show typical value.



7.4. Auto Azimuth Control Section

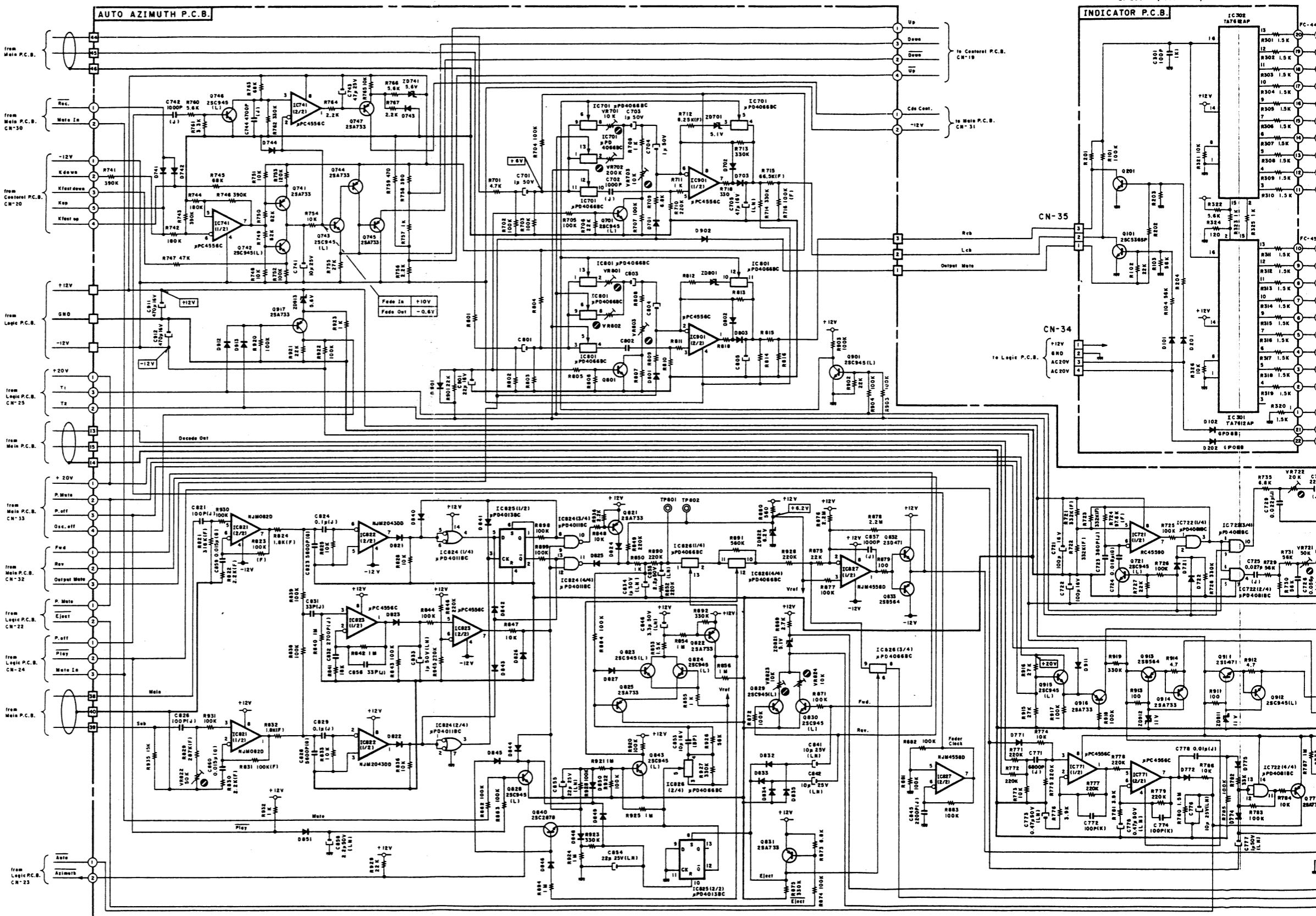


Fig. 7.4

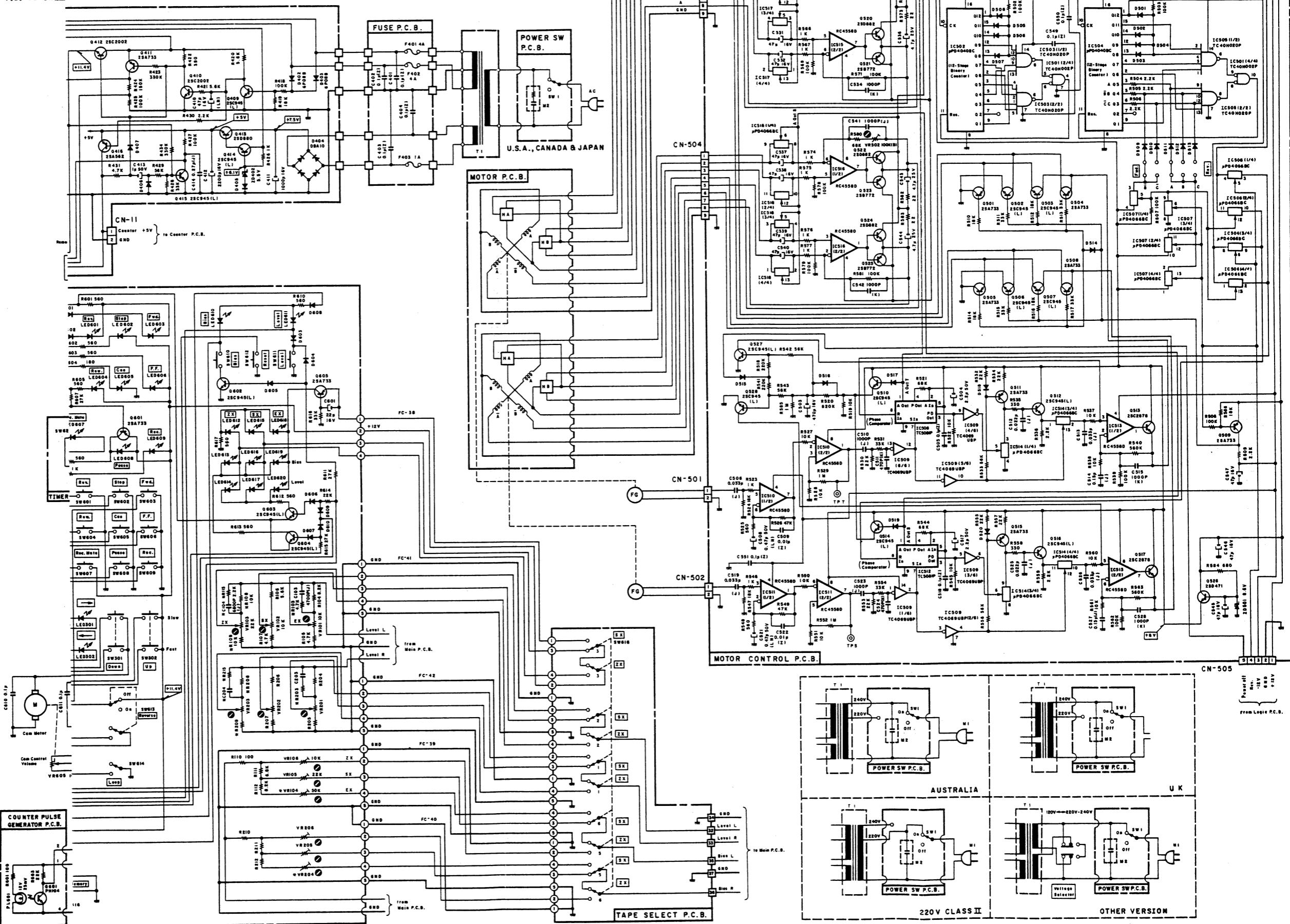
Notes: 1. Diode is 1SS53, 1S1555, or 1SS176 unless otherwise specified.
2. Resistor and capacitor marked with * show typical value.

2. Resistor and capacitor marked with * show typical value.

Notes: 1. 2SA733, 2SA608SP, 2SA1048 and 2SA1175 are interchangeable with each other.
2. 2SC2415, 2SC4716SP, 2SC6148 and 2SC6278S are interchangeable with each other.

2. 2SC945, 2SC536SP, 2SC2458 and 2SC2785 are interchangeable with each other.

7.5. Mechan



7.5. Mechanism Control Section

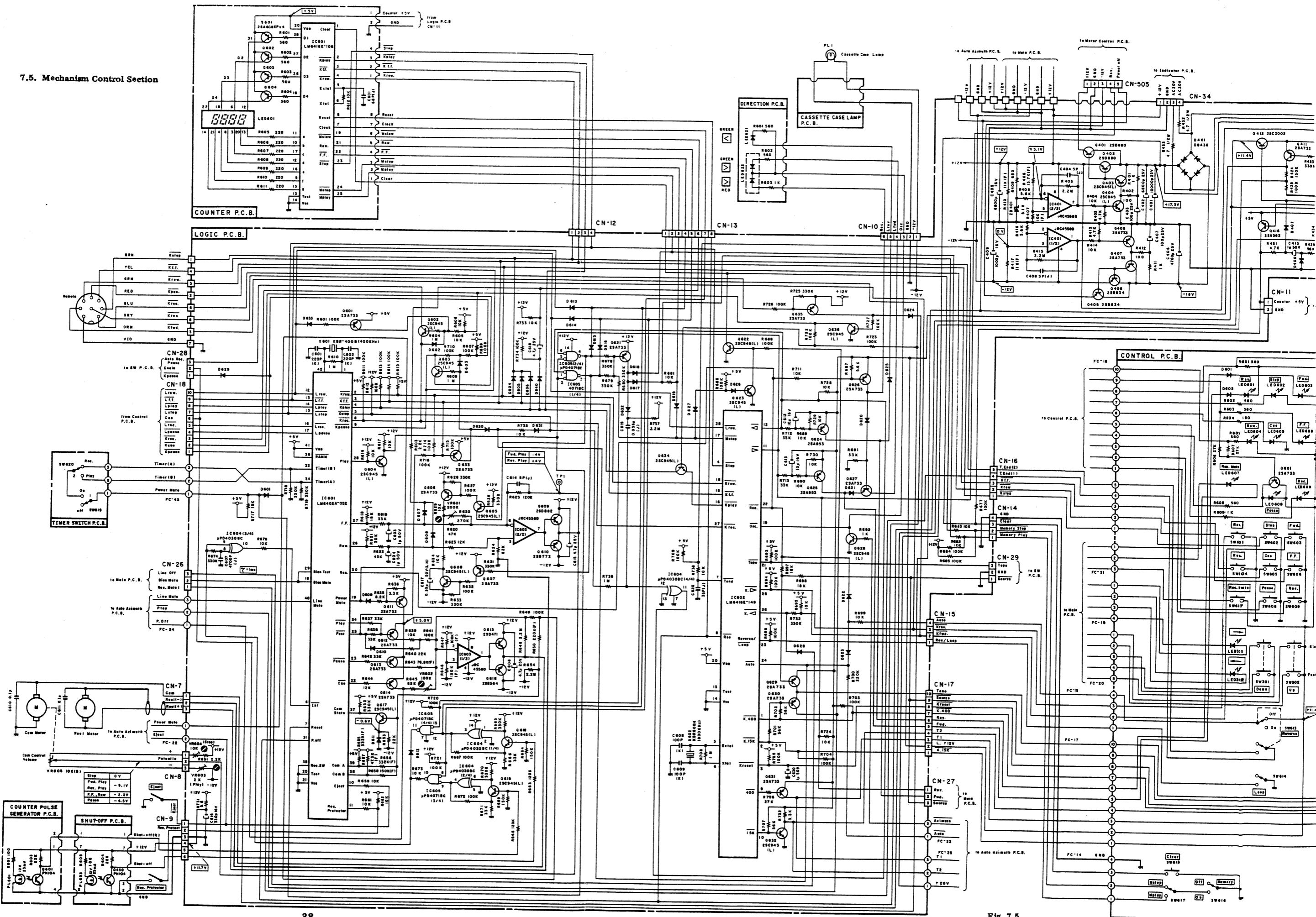
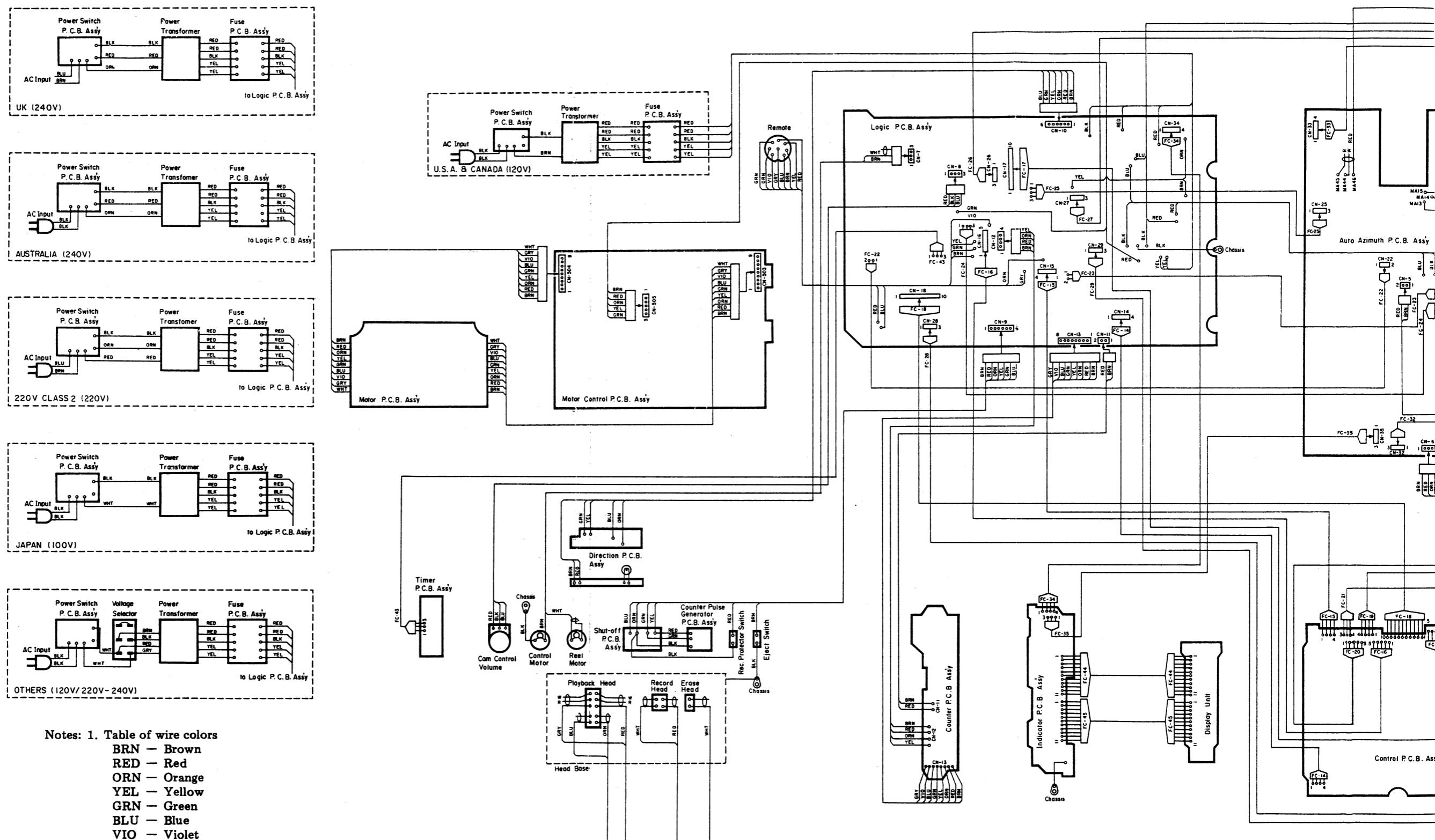


Fig. 7.5

8. WIRING DIAGRAM



Notes: 1. Table of wire colors

BRN — Brown

RED — Red

ORN — Orange

YEL — Yellow

GRN — Green

BLU — Blue

VIO — Violet

GRY — Gray

WHT — White

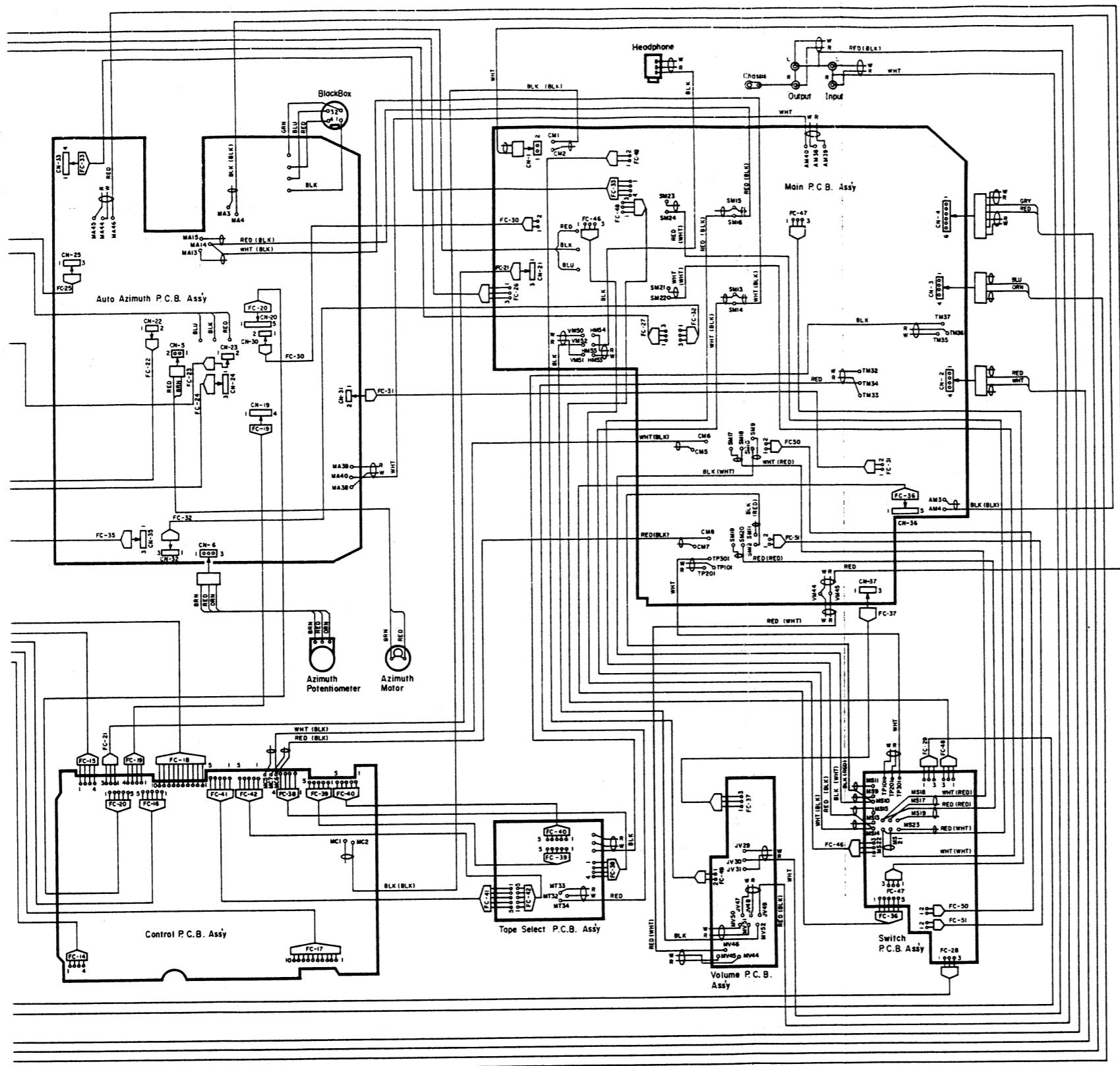
BLK — Black

2. Dip side view of the P.C.B. is illustrated.

3. Wire tube color is shown in ().

Fig. 8

9. TIMING CHART AND EQ. AMP. FREQUENCY RESPONSE



9.1. Overall Timing Chart

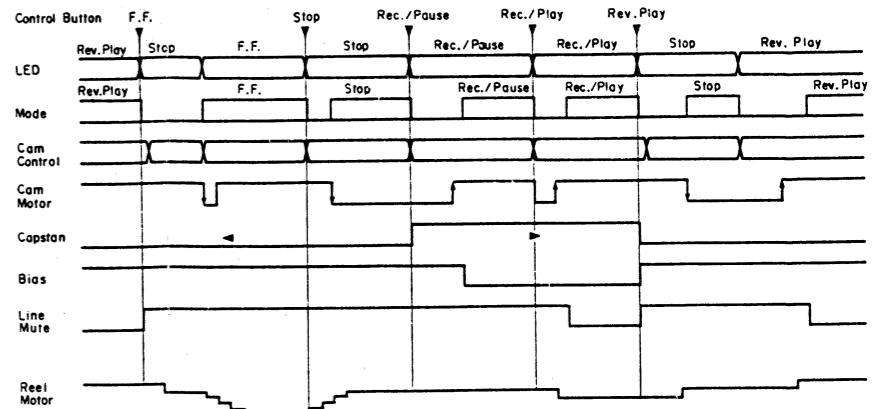


Fig. 9.1

9.2. Eq. Amp. Frequency Response

(1) Playback Frequency Response

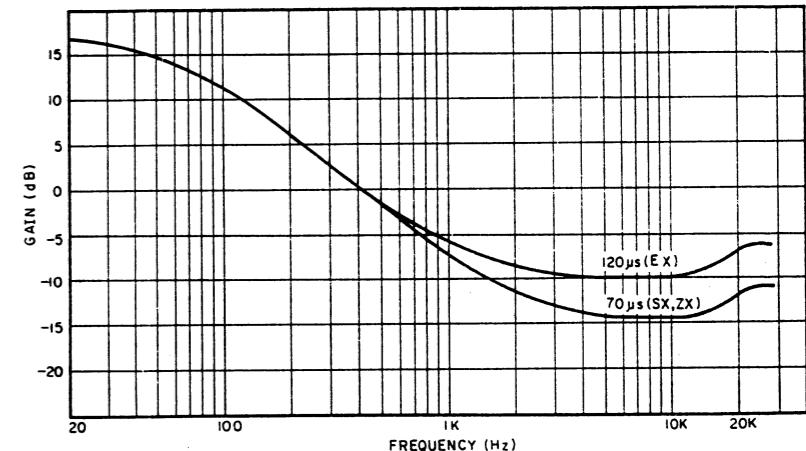


Fig. 9.2.1

(2) Record Current Frequency Response

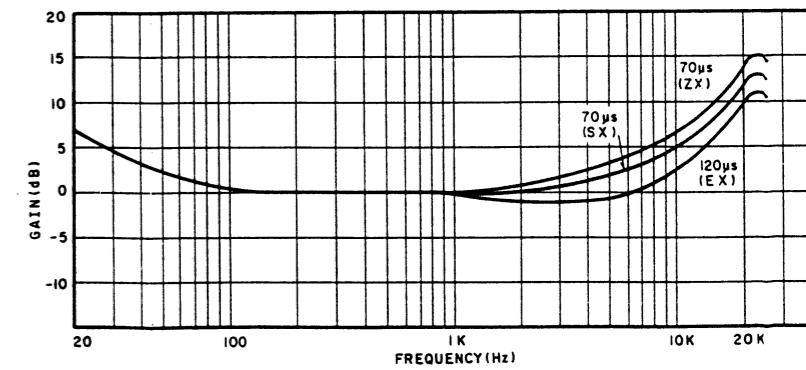


Fig. 9.2.2

10. BLOCK DIAGRAMS

10.1. Amplifier Section

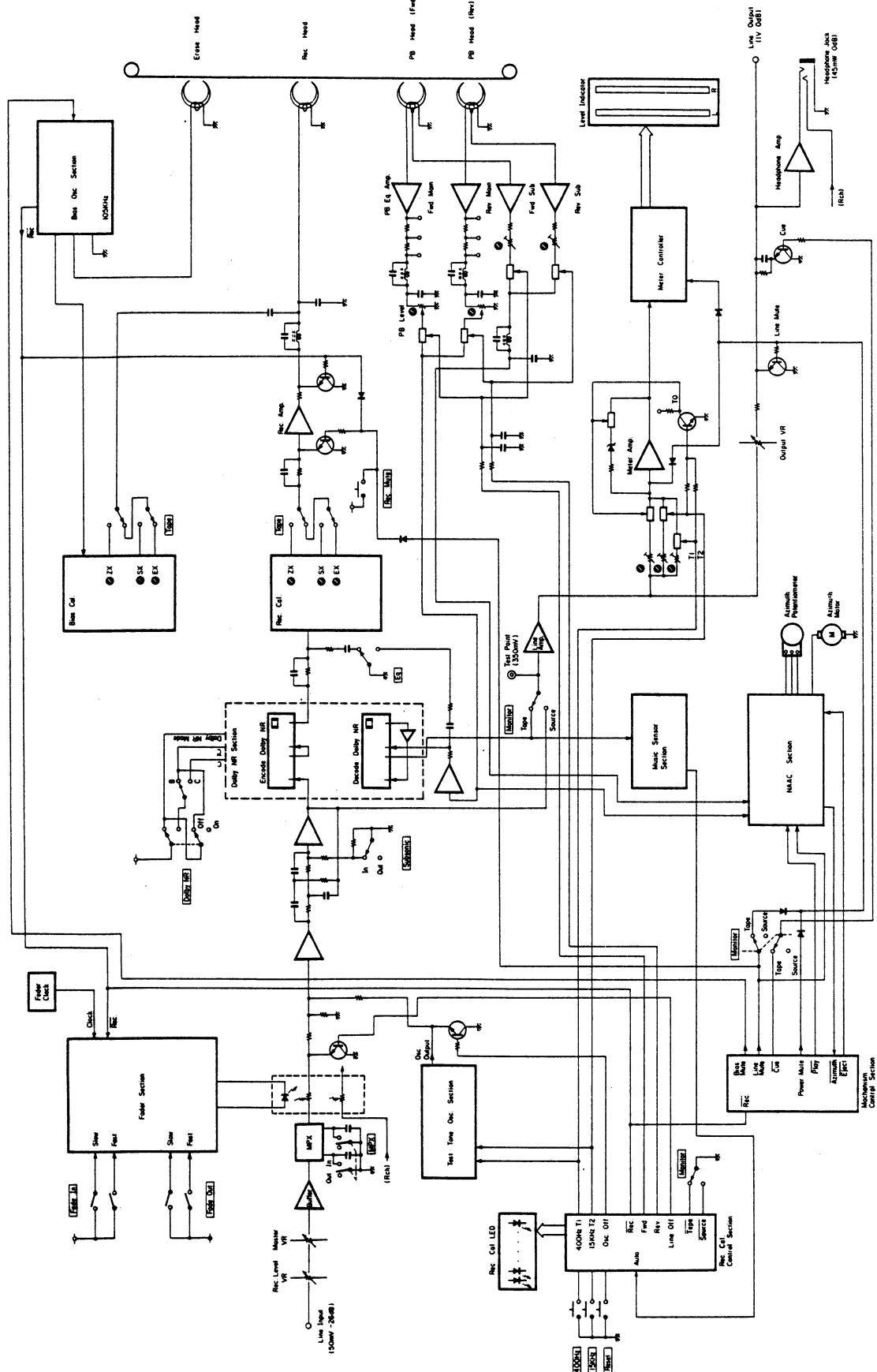


Fig. 10.1

10.2. Mechanism Control Section

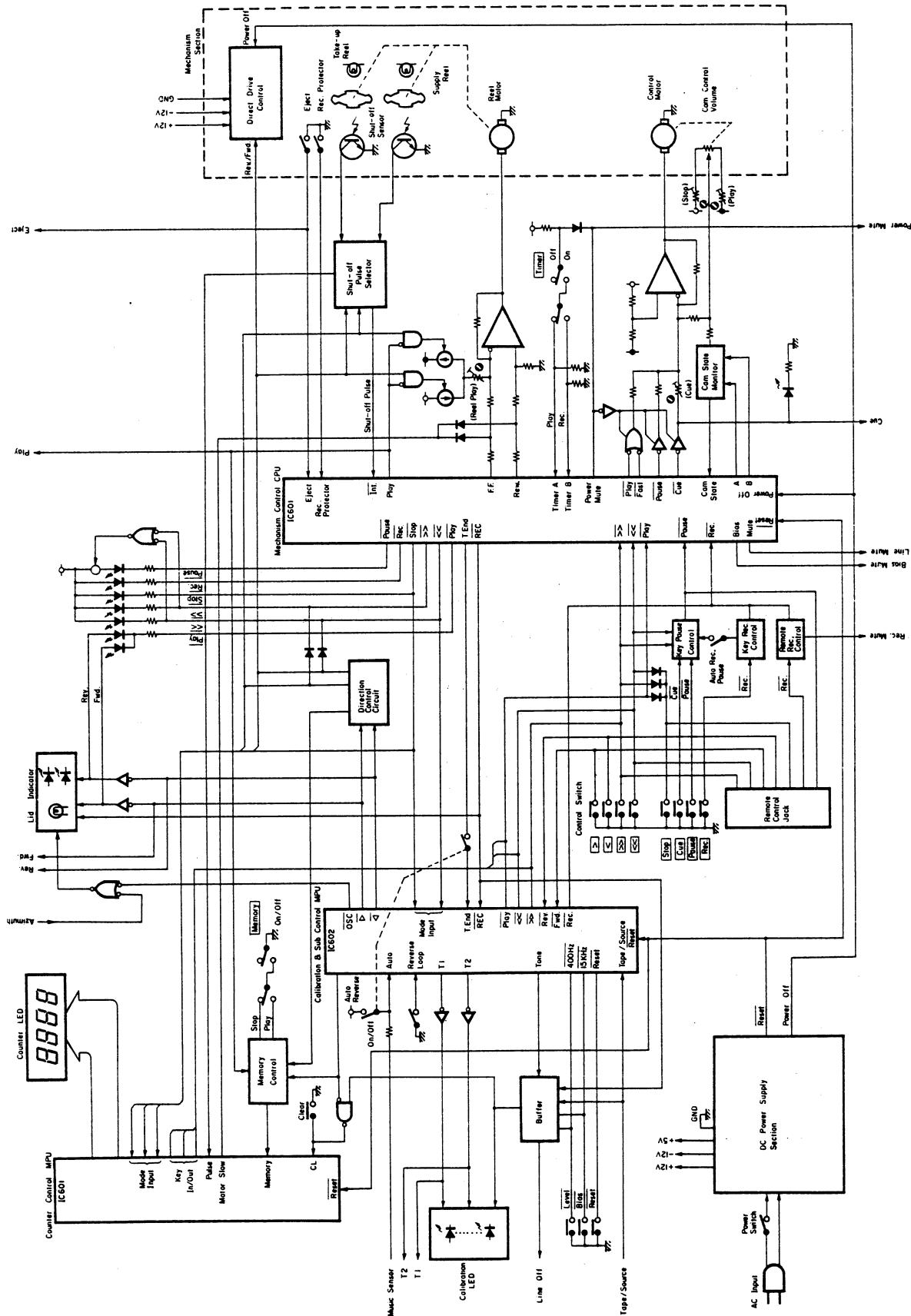


Fig. 10.2

11. SPECIFICATIONS

Track Configuration	4 Tracks/2-Channel Stereo (Playback auto reverse)
Heads	3 (Erase Head x 1, Record Head x 1, 4-Track, 4-Channel Playback Head x 1)
Motors	<ul style="list-style-type: none">● TRANSPORT Quarts PLL DC, Brushless, Slotless, Coreless, Super Linear Torque D.D. Motor (Capstan Drive) x 2DC Motor (Reel Drive x 1)● AUTO AZIMUTH CORRECTIONDC Motor x 1● MECHANISMDC Motor x 1
Power Source	100, 120, 120/220-240, 220 or 240 V AC; 50/60 Hz (According to country of sale)
Power Consumption	45 W max.
Tape Speed	1-7/8 ips (4.8 cm/sec.)
Wow and Flutter	Less than 0.019% Wtd rms Less than 0.04% Wtd peak
Frequency Response	20 Hz-22,000 Hz ±3 dB (recording level -20 dB, ZX Tape) 20 Hz-21,000 Hz ±3 dB (recording level -20 dB, SX, EXII Tape)
Signal to Noise Ratio	Dolby C-Type NR on <70 µs, ZX Tape> Better than 72 dB (400 Hz, 3% THD, IHF A-Wtd rms) Dolby B-Type NR on <70 µs, ZX Tape> Better than 66 dB (400 Hz, 3% THD, IHF A-Wtd rms)
Total Harmonic Distortion	Less than 0.8% (400 Hz, 0 dB, ZX Tape) Less than 1% (400 Hz, 0 dB, SX, EXII Tape)
Erasure	Better than 60 dB (100 Hz, 0 dB)
Separation	Better than 37 dB (1 kHz, 0 dB)
Crosstalk	Better than 60 dB (1 kHz, 0 dB)
Bias Frequency	105 kHz
Input (Line)	50 mV, 50 k ohms
Output (Line)	1 V (400 Hz, 0 dB, Output Level Control at max.) 2.2 k ohms (Headphones) 45 mV (400 Hz, 0 dB, output level control at max.) 8 ohms
BlackBox Series DC Output	±10 V, 125 mA max.
Dimensions	450 (W) x 135 (H) x 300 (D) millimeters 17-3/4 (W) x 5-5/16 (H) x 11-13/16 (D) inches
Approximate Weight	9.5 kg 21 lb.

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